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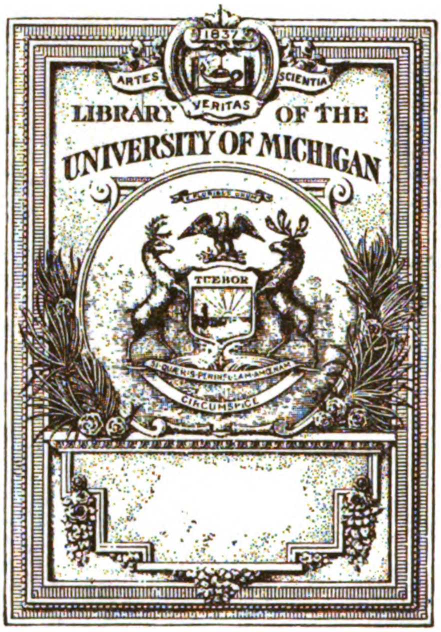

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ABSTRACTS

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VOLUME V

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A. PARKER HITCHENS

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SCIENTIFIC PROCEEDINGS OF THE SOCIETY OF AMERICAN BACTERIOLOGISTS

TWENTY-SECOND ANNUAL MEETING, DECEMBER 28, 29 AND 30, 1920, CHICAGO, ILLINOIS

FIRST SESSION

Tuesday, December Twenty-eighth

GENERAL AND TECHNICAL BACTERIOLOGY

1. *Report of Committee on Bacteriological Technic.* H. J. CONN, Chairman.

Committees dealing with various matters of bacteriological technic have been appointed at various times in the past, by this Society and by other organizations interested in bacteriology; but in general all these committees have had for their chief function the standardization of technic and the establishment of official methods. It seems, however, that this committee may have a wider usefulness as an agency through which different procedures may be compared and their relative merits for different purposes established, without giving official standing to any one technic.

The logic of such a committee program on the part of our Society is evident. The other bodies with committees on bacteriological technic are in general interested in methods that give uniform and reasonably reliable results with as little labor as possible, rather than in methods giving the most accurate scientific data. As a society of *bacteriologists*, however, we should be interested in the accuracy of technic, rather than in simple and inexpensive methods.

The lines of work undertaken by the committee during 1920 were: (1) work on the descriptive chart, a new chart being proposed, without the group number, and printed on both sides of an 8½ by 11 inch sheet; (2) work on methods of pure culture study; (3) work on methods of counting bacteria, the chief work during the year being done on ketchup; (4) a study of the situation relating to staining materials.

New lines will be undertaken, as far as possible, whenever they are referred to the committee for investigation.—*H. J. C.*

2. *The Work of the Committee on Nomenclature of the Botanical Society of America.* R. S. BREED.

A discussion of the work of this Committee of which a preliminary report has already appeared in Science, (1919, **49**, 333–336). It was brought out that the work of the sub-committee on the American Code was in general harmony with the desires of American bacteriologists as already expressed by their actions at the New Haven and Boston meetings of the Society, and a plea was made for cooperation of all scientists who are vitally interested in botanical nomenclature.—*R. S. B.*

3. *Preliminary Statement of a Project for a Laboratory for Research in Abstract Bacteriology.* L. A. ROGERS.

I. *The Problem.* To provide personnel and laboratory facilities for investigating problems in abstract bacteriology.

At present there is no laboratory devoted to the study of basic questions in bacteriology. In this respect bacteriology differs from other related sciences. In the universities chemistry, botany, and even specialized branches of botany, such as mycology, are taught as sciences in the academic departments. Bacteriology is taught in the medical school, or the colleges of agriculture, and the research laboratories are so closely allied to medicine, sanitary science, or agriculture that even when problems of a fundamental nature are investigated the research invariably drifts into the realm of applied science.

As a result we know the bacteria only at the points at which they touch our daily life. Between these points is an almost totally unexplored field. The author of a paper on the nature of bacteria in a recent number of a bacteriological journal apologizes for writing on this subject and incidentally brings out the fact that the questions raised by Cohn in 1853 as to the relation of the bacteria to other plants are still unsettled.

Our knowledge of bacteriology would be greatly advanced by a properly organized laboratory in which the study of the most fundamental questions touching the nature, life history, and physiology of the bacteria would be encouraged and any tendency to drift into the application of results would be discouraged.

II. Method. Concrete problems for investigation: (1) The problem of the nature of the bacteria. (a) The structure of the cell, processes of reproduction, life cycle. (b) The relation of the bacteria to other microorganisms and to each other; the taxonomy of the bacteria as a class and particularly those groups having no economic importance.

(2) Problems connected with the physiology of bacteria. (a) The nutrition of bacteria. By what means are bacteria enabled to utilize such a wide range of sources of nutriment and energy. (b) The relation of bacteria to certain physical and chemical conditions; the great variation in the reaction of different species to heat; the puzzling problem of anaerobic growth.

III. Means of providing for investigations of this nature: (1) By supplementing the funds of laboratories already established in colleges or other institutions. This plan is open to objection that the conditions which have retarded the development of abstract research in existing laboratories would apply in this case also.

(2) Through the establishment of an entirely new laboratory in a university under conditions which would remove it from the influence of the professional and technical schools.

(3) Through the establishment of a laboratory independent of existing institutions. This would obviously be the ideal solution. An adequately equipped and endowed laboratory in which difficult problems could be attacked with an assurance that support would be available until their completion would provide conditions under which continuous progress could be expected. The Geophysical Laboratory of the Carnegie Institution is an example of a laboratory of this kind.

IV. Cost. The cost is difficult to estimate because the scope of the investigation and the rapidity of its prosecution could be adapted to the means available. Also the funds necessary would be largely dependent upon the degree of independence of the laboratory from other laboratories. The minimum requirement would be provision for four investigators with current supplies and some clerical assistance and unskilled labor. A laboratory of this magnitude could not be maintained on less than $25,000 annually. This estimate is based on the assumption that quarters and initial equipment would be otherwise provided for.

V. Results which could be expected. It would be difficult to predict the nature or estimate the value of results obtained from investigations of this kind. It may be accepted, however, that the most valuable investigations, even from the so-called practical standpoint, are those of the most fundamental nature.

It is safe to say that results would be obtained which would provide a sound basis for work in medical, sanitary, and fermentation bacteriology.

With a better knowledge of the bacteria themselves many of the errors which take so many years to overcome can be avoided.—*Author's abstract.*

4. Indol Production by Bacteria. JOHN F. NORTON AND MARY V. SAWYER.

Media used for the indol test and reagents were compared. Trypsinized peptone or casein was found to give the best results. Ehrlich's reagent was found to be the most reliable for testing the presence of indol. The results of tests as reported in the literature are included in the summary of the authors' tests, giving a table showing indol and non-idol producing bacteria. With the exception of the cholera spirillum, all bacterial species that have been reported as positive have also been reported as negative.—*Authors' abstract.*

5. The Effect of the Surface Tension of the Culture Medium on the Growth of Bacteria.—W. P. LARSON.

This paper summarized the results of experiments conducted by growing bacteria upon broth, media, the surface tension of which ranked from 73 to 32 dynes.

The surface tension of ordinary broth is about 59 dynes. That of the various "inorganic" media using glycerine as source of carbon about 73 dynes.

The surface tension of media may be depressed by the use of neutral soaps, saponin or bile. The sodium soap of castor oil was found to be serviceable as it forms perfectly clear solutions in the absence of free calcium or magnesium. The author divides bacteria into two classes based upon their behavior upon media of varying surface tension.

The growth of the pneumococcus and streptococcus is suppressed where the surface tension is depressed to about 50 dynes. The surface tension limit of *B anthracis* is very sharp, being about 46 dynes. There is some question in the author's mind as to whether or not the suppression of growth of the above named microorganisms is due entirely to depressing the surface tension of the medium or whether the various surface tension depressants used might exert a specific toxic action upon the bacteria.

The intestinal bacteria grow well on low tension media. It was suggested that the favorable action of bile, with a surface tension of 43 dynes, was due in part to its low surface tension.

Governed by well-known physical laws, the surface tension depressants in culture media concentrate in the surface layers of the media. This would explain why the colon-typhoid-cholera group selects the surface zone for growth, which is so characteristic of the cholera vibrio.

The pellicle forming bacteria are attracted to the surface by the surface tension depressants. Pellicle formation is merely a question of wetting. By depressing the surface tension they grow throughout the medium or even at the bottom of the flask.

Non-pellicle forming bacteria may form the "pellicle habit" by prolonged culturing on media of high surface tension. After the "habit" has been formed, pellicle formation continues when grown on ordinary broth, this being due, in all probability, to such disposition of the lipoids as to prevent wetting.

Symbiosis and antibiosis are, in some cases, due to surface tension phenomena.

The weigh drop method of measurement is considered standard in dealing with colloids, although the direct method may be used where carefully controlled.—*Author's abstract.*

6. *The Decomposition of Tryptophane by Staphylococci without the Production of Indol.* S. Bayne-Jones and Pauline Zinninger.

Only a few questionable reports in the literature are apparently the basis for the generally accepted opinion that staphylococci produce indol. On the other hand, there have been investigations which contradict this statement.

In an attempt to settle the question, staphylococci were studied in a number of media suitable for indol production. Strains of white and yellow staphylococci were collected from wounds, furuncles, cases of septicemia, from feces, decomposing meat, from dust and air. Of these, 115 strains were studied in detail, while indol tests on cultures in the ordinary peptone water were made on about 75 others. The media used were 1 and 10 per cent peptone water, trypsinized casein, 5 per cent egg-albumin, synthetic media composed of tryptophane and asparagin, and a synthetic medium composed of tryptophane as the only source of nitrogen. The staphylococci were placed under both aerobic and anaerobic conditions, and tests of the cultures for indol were made at intervals of 2 days, 4 days, 1 week, 2 weeks and in some cases 3 weeks. Ehrlich's paradimethylamidobenzaldehyde reagent and the nitrite-sulphuric acid reagent were used in these tests. Tests were made directly in the culture fluids, and with the distillates of the fluid of several strains. In no case was a positive indol reaction obtained.

The medium in which tryptophane was the only source of nitrogen served for the growth of staphylococci, but was not decomposed to indol.

These experiments lead to the conclusion that staphylococci do not produce indol.—*Authors' abstract.*

7. *A Modification and a New Application of the Gram Stain.* G. J. Hucker.

A description of a method for staining dried films of milk with a modified Gram stain. The preparation is dried, fat removed by xylol, fixed with alcohol and stained with anilin gentian violet (2 per cent) for 45 seconds. The slide is then immersed in Gram's solution for one minute after which the stain is removed by a solution of anilin oil, 1 part, xylol, 2 parts, and alcohol (95 per cent), 95 parts. Counterstained with Bismarck brown for 45 seconds.

Preparations made by this method were found useful in examining milk received at cheese factories where a study of the types of organisms present in the milk was desired.—*Author's abstract.*

Second Session

Tuesday, December Twenty-eighth

GENERAL AND TECHNICAL BACTERIOLOGY—*Continued*

8. *The Effect of Vitamine Extracts in Revivifying Old Cultures.* Jean Broadhurst.

The following work (by Misses Terrigo and Barnett) is part of a series of experiments with vitamine extracts, and demonstrates the revivifying effect of a vitamine extract containing water-soluble B on various species of bacteria.

Old agar cultures (3 to 24 weeks old) were flooded with water to yield a suspension of the more or less dried organisms. Single loopfuls of this well-shaken suspension were transferred to each of two tubes, one tube containing 10 cc. of ordinary broth and the second tube containing 10 cc. of the same broth plus 1 cc. of water-soluble B extract of the navy bean.

At intervals (6 hours, 24 hours, etc.) single loopfuls of each of these broth suspensions were used to make agar plates. Nearly two-thirds of the 30 species tried showed marked increase due to the vitamine extract additions—often 40 to 2000 times as many colonies developing on the vitamine broth plates, and in a few cases, 11,000 to 28,000 times as many. As shown in the photographs exhibited, the increase varied not only with the organisms but with the length of the vitamine treatment. The most striking differences were obtained with species of *Azotobacter*, *Proteus*, *Erythrobacillus*, *Chromobacterium*, and *Bacterium coli*, *Bacterium paratyphosum* A and B, *Bacillus liodermos* and *Bacillus pseudo-tetanicus*. The work was controlled by plating out the vitamine extract to demonstrate its sterility; every series for each organism was done in duplicate, a full set for each dried culture by each of the two students named.—*Author's abstract.*

9. *The Influence of Carbohydrate on the Nitrogen Metabolism of Bacteria.* Leo F. Rettger.

In further defence of statements by Berman and Rettger (J. Bact., 1918, **3**, 389–402) that the retarding or preventive influence of a utilizable carbohydrate on nitrogen metabolism may be materially modified when appreciable amounts of a buffer like di-potassium phosphate are employed in the medium, attention is drawn to the following observations.

B. coli attacks glucose very readily both in the presence and absence of the buffer, and unless the amount of acid produced is such as to prevent further growth the carbohydrate supply becomes completely exhausted. Complete removal of the glucose when present in small amounts (0.2 per cent) is accomplished within 24 hours at 37°C. *B. coli* is an admirable organism, therefore, for depriving culture solutions of their last trace of muscle sugar. *Proteus vulgaris*, on the other hand, does not follow the same law. It may at times attack glucose with some avidity, and cause it to disappear largely or even entirely, but its action is variable. Different strains will not yield the same results, nor will the same strains accomplish the same results at different times.

The experiments of Berman and Rettger have in part been repeated quite recently by the present writer, and have been substantiated. Particular attention was given to the following medium for metabolism study: Peptone 0.5 per cent, beef extract 0.25 per cent, NaCl 0.5 per cent, glucose 0.2 per cent and di-potassium-phosphate 0.5 per cent. *B. coli* and *Proteus vulgaris* were used in comparative studies. The medium was inoculated with different strains of these two organisms, and incubated for varying periods. Chief emphasis was placed upon the test for reducing substance by the Benedict method. Observations were made at the end of 1, 2, 3, 5 and 7 days.

In every instance the tests for sugar in the *B. coli* cultures were negative at the close of the first 24 hours' incubation period. In none of the *Proteus vulgaris* cultures had the sugar completely disappeared during the first 24 hours; furthermore, a reducing substance was still discernible after 48 hours. The rate of disappearance was not as a rule the same, varying markedly at times. Very few of the tubes inoculated with *Proteus vulgaris* gave negative results with Benedict's solution at the end of 3 days, and most of them still contained some of the reducing substance at the end of a week, when apparently all activities had ceased.

Jones' contention (J. Inf. Dis., 1920, **27**, 169–172) that the phosphate in the medium interferes with the test for sugar is unsound, and Jones would not make such a claim if he were familiar with the principles and application of the test. Both the Fehling and the Benedict tests for sugar were intended to be used, and are constantly being used, for solutions and media which contain considerable phosphate, as for example urine and milk (the latter after the removal of the coagulable protein). The error that is often made by those not familiar with the tests is that the Benedict solution is added to the test fluid, instead of the reverse process. When bacterial cultures are examined the turbidity must first be removed through paper pulp or some other filter and absorbed. A solution obtained in this way, in spite of the 0.5 per cent phosphate, will give a reduction with the copper solution which is unobscured by the phosphate or any other ingredient, even though very minute quantities of the sugar are present.

A very common error has been made in the past by assuming that the statement so often quoted "Fermentation takes precedence over putrefaction" is applicable to all bacterial species and fermentable sugars. This is a law in so far as *B. coli* and its activities in ordinary dextrose broth are concerned, and undoubtedly in certain other isolated instances. But there are many exceptions when the rule is applied generally. For example, while indol production cannot be demonstrated in a glucose broth culture of *B. coli*, a lactose broth culture of this same organism will show indol production, especially when it contains tryptophane. The lactose, while it is available, does not furnish energy as readily as glucose or some of the nitrogenous substances present, and hence nitrogen metabolism continues at a higher rate. Further, *B. subtilis* attacks dextrose in glucose broth, but its preferences are such that it continues to utilize the nitrogenous substances to such an extent that the alkali production at least keeps pace with the acid formation and the biuret-giving substances, if present in not too large amounts, will disappear while some of the glucose still remains undestroyed. Many organisms show the same deportment, and instances may be multiplied.—*Author's abstract.*

10. *The Reducing Action of Micro-Organisms on Ammonium Molybdate.* VICTOR E. LEVINE AND HERMAN M. JAHR.

Preliminary observations point to the fact that bacteria reduce ammonium molybdate in peptone broth, giving rise to an intense blue coloration. In the absence of bacteria, the molybdate is reduced but very slightly, an indistinct and faint greenish tinge resulting. Of all the organisms tested on solid media, ammonium molybdate is found to be reduced with *B. coli*, the blue color developed following the path of growth. Peptone broth containing glucose, kept at 37.5°C., reduces very heavily even in the absence of bacteria. Peptone broth containing 1 per cent lactose and 1 per cent ammonium molybdate yields characteristic reduction only in the presence of organisms. Heavy growth is accompanied by profuse reduction; lack of growth corresponds to absence of blue color. The lactose fermenters used react in various ways. *B. aerogenes* gives heavy growth and intense reduction; *B. acidi lactici*, slight growth and slight reduction (gray-blue); *Strep. pyogenes* and *Alb. urea* give no evidence of growth or reduction; *B. coli* yields excellent growth and causes profuse reduction. No relation between reduction and fermentation can be observed, judging from the behavior of lactose fermenters and non-fermenters towards ammonium molybdate. *B. subtilis* and *B. alcaligenes* respond negatively both to growth and to reduction, *B. enteriditis* gives evidence of very slight growth and also of very slight reduction, while *B. proteus vulgaris* yields fair growth and fair reduction.

Yeast cells also possess the power of reducing ammonium molybdate. Reduction is accelerated at room temperature by glucose and other fermentable carbohydrates. Although glucose itself reduces molybdate solutions of higher temperatures, it does not act so at room temperatures. Killed yeast cells display no reducing power.

In the case of ammonium molybdate, the reduction caused by bacteria and yeast is ascribed partly to the presence of an endoenzyme, reductase, and partly to metabolic products of micro-organic origin.

Small amounts of ammonium molybdate do not retard growth of bacteria. In relatively large concentrations (1 per cent) the extent of retardation or complete inhibition varies with the organism. Intensity of reduction is proportionate to the rate of growth. It may be possible, by regulating the composition and the reaction of the medium, and also the temperature of incubation, to make use of the reduction of ammonium molybdate as a differential test.—*Authors' abstract.*

11. A Micro Electrometric Method for the Determination of Carbon Dioxide. ARAO ITANO.
The principle of the method depends upon the decrease of electrical conductivity of barium hydroxide solution or increase of resistance upon the formation of barium carbonate when it absorbs the carbon dioxide according to the following equation:

$$Ba\ (OH)_2 + CO_2 = Ba\ CO_3 + H_2O.$$

An arrangement of the apparatus is shown by which several possible sources of error may be eliminated.

By this method, the quantitative determination of the carbon dioxide given off in various bacteriologic materials may be made continually.—*Author's abstract.*

12. A Stable Single Buffer Solution. S. F. ACREE AND R. R. MELLON.
A single buffer solution has been devised which covers a wide pH range (pH 1 to pH 12). It is composed of several substances, the ionization constants of which are so graded that the titration curve is practically a straight line. The incorporation of thymol in the curve insures the stability of the solution, which has been used for over a year without deterioration. It has been checked repeatedly, colorimetrically and electrometrically.

Its chief use is as a standard for colorimetric comparison. By consulting the curve, the amount of alkali or acid necessary to give any desired pH is read off. This amount is then added to 10 cc. of the buffer solution and diluted to 20 cc. with water. The indicator covering the pH is then added. This is conveniently employed in the form of tablets of sugar of milk impregnated with a definite quantity of the dye.—*Authors' abstract.*

13. A Simplified Hydrogen Electrode Potentiometer Outfit. E. A. SLAGLE AND S. F. ACREE.
A brief history of the development of electro-chemical methods to meet the requirements of the biological and industrial chemist. A double hydrogen electrode and potentiometer is described. The new electrode apparatus requires no shaking and liquid contact potentials are practically eliminated. The large electrodes are free from polarization. Determinations can be rapidly made and the apparatus can readily be adapted to measure the pH of small amounts of material — 2 to 5 cc. The results are reproducible to ± 0.2 m. v.

A pyrovolter of simple construction and operation has been developed based on the potentiometer system and giving direct readings to 0.2 m. v. on scales of 0–200 m. v. and 0–500 m. v. The double hydrogen electrode, pyrovolter, hydrogen cylinder and all necessary equipment for pH determinations can be carried in a suitcase. The determination of the H-ion concentration is claimed to be much simplified by the apparatus described, and the accuracy to be as high as is attainable today.—*Authors' abstract.*

14. The Ionization Constants of Glycerophosphoric Acid and Their Use as Buffers, especially in Culture Media. RALPH R. MELLON AND S. F. ACREE.
The chief object of this investigation had to do with the prevention of the precipitation of phosphates and related substances from culture media, near the neutral point, inasmuch as their value as food substances is well known. No satisfactory method has been devised hitherto to keep them in solution. The superior solubility of the glycerophosphates for calcium and magnesium and perhaps other salts, prevents any considerable precipitation on the alkaline side of neutrality when used in broth. With a concentration of M/10, an initial pH 8 was maintained after autoclaving. The ionization constants of the glycerophosphates are so close to KH_2PO_4 that they may be used as buffers to replace the latter.

The solubility of these salts as mentioned also suggests their employment in the washing of agar, in the precipitation of casein and for the study of the effect of calcium and magnesium ions on the growth of various organisms. The study of the value of glycerophosphates as food substances is not yet complete.—*Authors' abstract.*

15. Studies on the Hydrogen-Ion Concentration and the Metabolism of B. typhosus. CORNELIA M. DOWNS.
In a former paper the author reported the typing of *B. typhosus* into 4 antigenic types. The work here reported is preliminary to further work on the biochemical reactions of *B. typhosus* and in view of the stress that has been laid on the final hydrogen-ion concentration of various organisms and its relation to bacterial metabolism it was thought advisable to determine the final hydrogen-ion concentration and any variations that took place during the period of growth.

All pH determinations were made by the colorimetric method on meat infusion 1 per cent dextrose broth adjusted to pH 7.4. After inoculation readings were made at 24-hour intervals and on the third day growth was tested for.

The hydrogen-ion concentration in 24 hours changed to a reaction varying from pH 5.1 to 4.9. By the third day all but 3 strains reached a reaction 0.2–0.4 more alkaline than the 24-hour reading, thus showing a definite return toward the alkaline side. With 4 exceptions all strains were dead on the fourth day.

Because of progressively alkaline reactions given by these strains a few experiments were made to determine the percentage of dextrose used in 24 hours and after 4 days or longer if the organism was viable. In most cases about 30 per cent of the sugar was used in 24 hours. Those organisms giving a more acid reaction in 24 hours used less sugar than those giving a more alkaline reaction. After the fifth day the amount of sugar used was increased by about 0.17 per cent in spite of the progressively alkaline reaction. In all cases from 68 to 70 per cent of the sugar was left after growth ceased.—*Author's abstract.*

16. Salt Effects in Bacterial Growth. George E. Holm and James M. Sherman.

Many of the neutral salts are observed to have very marked effects, either beneficial or detrimental, on the growth of bacteria. The results here reported constitute the observations which have been made on the effects of various salts upon the growth of *Bacterium coli.* Tested in 0.2 molecular concentration the sodium salts of the following anions have been observed to increase the rate of growth of *Bacterium coli,* Cl, I, NO_3, SO_4, and lactate; while F, acetate, oxalate and citrate have a retarding action. Potassium chloride and ammonium chloride appear to have about the same stimulating action as sodium chloride, while magnesium chloride in 0.1 molecular concentration stimulates the growth of *Bacterium coli* to about the same degree as 0.2 molecular concentration of the other salts; magnesium chloride in a 0.2 molecular concentration, however, has a retarding action. In relation to hydrogen ion concentration the action of the salts, whether beneficial or detrimental, appears to be magnified near the extremes at which the organism grows, that is, stimulating salts appear to widen the optimum zone of growth, while the detrimental salts seem to narrow the optimum range.—*Authors' abstract.*

17. The Propionic Acid Fermentation. James M. Sherman and Roscoe H. Shaw.

The organism used in these studies was the one which has been tentatively designated as *Bacterium acidi-propionici* (*d*) and which has been shown to be the casual factor in the production of eyes and flavor in Swiss cheese.

Lactose is fermented by this organism with the production of propionic acid, acetic acid and carbon dioxid; the propionic acid and acetic acid being produced in the ratio of about 2 to 1. In lactose media with calcium carbonate, fermentation is quite active but propionic acid is not produced in quantities sufficient to be of commercial importance. However, when grown in combination with certain other bacteria the yield of propionic acid is greatly increased. The greatest stimulating action has been obtained by growing it with *Lactobacillus casei.* That this stimulating action of *Lactobacillus casei* is not due to the conversion of the lactose to lactic acid is indicated by the fact that a similar increased production is obtained when calcium lactate is used instead of lactose, and also by the fact that certain non-lactose fermenting bacteria also stimulate the propionic acid producing organism.—*Authors' abstract.*

18. Some Notes on the Lactobacilli. James M. Sherman.

The work thus far done with the aciduric bacteria is preliminary in nature; the notes here recorded are published as suggestions which may be of value to those making more extensive studies of this group. The observations here reported have been made on a small collection of 38 cultures including authentic cultures of *Lactobacillus bulgaricus, Lactobacillus acidophilus* and *Lactobacillus bifidus* from other laboratories, as well as unidentified cultures from intestinal contents, silage, milk and cheese.

One of the significant physiological characteristics of this group of organisms is the rather unusual property among bacteria of acid production in sugar-free media. This characteristic has been observed in all of the cultures which have been studied of the milk-active aciduric organisms. The measurement of the carbon dioxid production by these bacteria shows that it is produced in significant amounts by many of these organisms; the observations thus far indicating that the true bulgaricus type produces less than the intestinal forms. A study of the temperature relations of the lactobacilli seems to be of much promise since the bulgaricus type does not grow at all at 15°C., and grows little or not at all below 20°, whereas the casei and intestinal types grow at this temperature. The true bulgaricus type cannot initiate growth at an alkalinity greater than about $pH = 7.5$ to 8.0, whereas the intestinal types do grow at that reaction. The true bulgaricus type is more sensitive to salts than are the other lactobacilli as is indicated by the detrimental action of phosphates and sodium chloride. Some results have been obtained which suggest the necessity of an accessory food compound in the growth of certain of the aciduric organisms.—*Author's abstract.*

19. The Change in the Hydrogen-ion Concentration of Various Mediums during Heating in Soft and Pyrex Glass Tubes. J. R. Esty and P. H. Cathcart.

1. Heating unbuffered solutions in soft glass tubes greatly affects the hydrogen-ion concentration.

2. Heating mixtures of Na_2HPO_4 and KH_2PO_4 in pyrex glass tubes does not appreciably affect the hydrogen-ion concentration during the heating. Soft glass tubes give off an excess of alkali after a certain time, which changes the pH.

3. Heating the food juices extracted from canned corn, peas, string beans, spinach, beets, sweet potatoes, and pumpkin in soft glass tubes affects the hydrogen-ion concentration less than pyrex glass. A longer time is necessary to destroy the same suspension of spores in corn juice if heated in soft glass tubes than in pyrex glass tubes due to the increase in acidity that is produced by heating in the latter.

4. Regarding the use of pyrex and soft glass tubes for heating solutions for indefinite periods without changing the hydrogen-ion concentration during the exposure, no general statement can be made. The type of tube to be used for this purpose must be determined for each solution. It is very important, especially in thermal death point determinations, that the pH of the solution be known at definite intervals during the heating.—*Authors' abstract.*

THIRD SESSION

Wednesday, December Twenty-ninth

AGRICULTURAL AND INDUSTRIAL BACTERIOLOGY

20. *The Relation of the Growth of Bacteria to the Coagulation Temperature of Evaporated Milk.* L. A. ROGERS, E. F. DYSHER AND F. R. EVANS.

There is no very definite relation between the hydrogen-ion concentration of the raw milk and the coagulation temperature of the evaporated milk. There is a comparatively wide limit within which the hydrogen-ion concentration may vary without affecting the coagulating temperature. On the other hand, a very small change in the hydrogen-ion concentration from the normal for that particular milk will cause a marked change in the coagulating temperature.

The temperature of coagulation may be lowered without appreciable change in the hydrogen-ion concentration by the growth of bacteria of the liquefying type. This is evidently due to the action of rennin on the casein.—*Authors' abstract.*

21. *The Relationship between the Hydrogen-ion Concentration and the Bacterial Counts of Cow's Milk (A Preliminary Report).* EDWIN W. SCHULTZ, ALBERTA MARX AND HAROLD J. BEAVER.

The colorimetric method for determining the hydrogen-ion concentration is employed. For standard buffer solutions Sørensen's mixtures of primary and secondary phosphates are used from pH 6.8 to 5.2, and Clark and Lubs' KHPhthalate-NaOH mixtures from 5.0 to 4 6 Brom-thymol blue is used as an indicator from pH 6.8 to 6.0, and methyl red from 6.0 to 4.6. The milk is dialysed 5 minutes; the indicator added to the dialysate, and the reading made. The bacterial counts are made in accordance with the standard methods set by the American Public Health Association.

A chart is presented showing the results thus far obtained. It is interesting that at a pH of 6.6 the bacterial counts begin to run high, averaging 12,000,000; at 6.5 reaching an average of 100,000,000; at 6.4, 150,000,000, etc., though at these pH readings the acidity cannot be detected by taste.

It is hoped that with further determinations a curve of average counts for the range of acidity will be obtained which shall be of value in indirectly estimating the number of bacteria in milk; a matter of a few minutes rather than hours required for actually making bacterial counts. This method would be of value in children's institutions and other places where it is important to determine immediately the quality of milk before its consumption.—*Authors' abstract.*

22. *Bacteria Concerned in the Fermentation of Corn Silage.* P. G. HEINEMAN AND CHARLES R. HIXSON.

Samples of corn silage were obtained from 3 silos in November, January, February, March, April and June. The different stages of fermentation could therefore be studied and the progress of fermentation observed. Ten grams of each sample were infused with 50 cc. of cold sterile physiological salt solution, and from this infusion stains and cultures were prepared. The media used were milk with brom-cresol-purple as indicator, 2 per cent dextrose broth in flasks and fermentation tubes, and agar.

The silage infusion contained enormous numbers of microorganisms of which the predominating types were studied. Yeast cells were invariably present, but never appeared in sufficient numbers to warrant the assumption that they played an important rôle.

Our studies have led to the conclusion that distinct phases of fermentation can be observed. The first phase is governed by members of the coli-aerogenes group and is accompanied by gas formation. These bacteria disappear during later stages, unless they are present in insignificant numbers. The second phase is dominated by streptococci and this group of organisms is well represented to the end. The third and presumably last phase shows lactobacilli in large numbers. This phase may be subdivided into two minor phases. The first of these shows the presence of a lactobacillus which is difficult to cultivate and shows granules when stained with methylene blue. It occurs chiefly in single cells. The second subphase shows the presence of a streptobacillus which also belongs to the group of lactobacilli. This bacillus grows abundantly in dextrose media and produces up to 11.5 per cent acid in dextrose broth in 6 to 7 days. The streptobacillus does not seem to be present in early samples, at least not in appreciable numbers.

As the fermentation progresses the majority of bacteria gradually disappear with exception of streptocococci and lactobacilli. The disappearing bacteria probably have no bearing on the fermentation, excepting the probability that by utilizing free oxygen they create conditions favorable for the development of facultative anaerobes, namely streptococci and lactobacilli.

It has been stated by Babcock and Russell that the ripening of silage is a respiratory process. Our hypothesis does not interfere with this assumption and it is possible that the fermentation of silage is actually initiated by a respiratory process. We were unable, however, to observe an alcoholic or acetic acid fermentation, as noted by Esten and Mason, and we did not succeed in isolating butyric acid bacilli which Gorini found in ensilage.

Since members of the coli-aerogenes group, streptococci and lactobacilli are widely distributed in nature and further since lactobacilli have been found on corn by several investigators, the hypothesis advanced in this paper assumes a reasonable aspect, although confirmatory evidence is desirable. The phases which we observed should not be considered as inseparable. Probably different portions of silage in the silo are in different stages of fermentation and there can be no doubt that other circumstances, as moisture, climatic conditions, and perhaps the construction of the silo may have considerable influence on the character of the product.—*Authors' abstract.*

23. *Some of the Chemical and Bacteriological Changes in Inoculated Corn Silage.* WILLIAM C. FRAZIER.

Experimental silos were inoculated with: (1) a culture of a pentose-fermenting, lactic acid organism, *Lactobacillus pentoaceticus*; (2) a mixed culture of *Bact. lactis acidi* and *Bact. bulgaricum;* (3) a mixed culture of *L. pentoaceticus*, *Bact. lactis acidi* and *Bact. bulgaricum.* Silage from these silos and from control silos was examined chemically and bacteriologically at various stages in the fermentation. The results indicate:

(1) That of a number of media used 1 per cent glucose yeast water agar, pH 6.8, was the best, since it gave the highest counts and the greatest number of different colonies.

(2) That the true lactic organisms persist and act only during the first few days of the fermentation.

(3) That the presence of the pentose-fermenting, lactic acid type of organism influences the chemical composition of the silage, with an increase in the alcohol and volatile acid content.

(4) That inoculation may hasten and intensify the production of certain products during the early stages of the fermentation, but that in later stages both chemical and bacteriological analyses of all inoculated and uninoculated silage show approximately the same results.

(5) That in the flora of both inoculated and uninoculated silage the pentose-fermenting, lactic acid type of organisms finally predominates, accompanied by a short, round-ended rod, often in pairs, resembling somewhat *B. lactis acidi*, but iridescent on a glucose yeast water agar slant. A negative test for catalase indicates that both of these organisms belong to the lactic group.

(6) That while the production of alcohol in the first few days of fermentation may be due to yeasts, the production of alcohol which takes place later when yeasts are not present in great numbers, is probably due to the action of this predominating, pentose-fermenting type of lactic organism, which ferments hexoses and pentoses with the formation of considerable amounts of alcohol.—*Author's abstract.*

24. *An Abundant but Little Known Group of Soil Bacteria.* H. J. CONN.

There is a group of soil bacteria, concerning which our principal knowledge has been that they produce pin-point colonies on gelatin or agar plates, a group which seems to be the most numerous one in soil. Any factor, such as aeration, manuring, or freezing, which disturbs the equilibrium of the soil flora, causes greater increases in this group than in any of the others present. These facts have been realized in a general way for at least 20 years, and yet the group has been given no especial attention. The excuse for such a situation is that these organisms grow very poorly in our ordinary media and by the usual tests give only negative reactions. At first thought it hardly seemed possible that such inert bacteria could have much significance in soil. It proves, however, that they are not actually inert, but that the negative results of all the tests were due to faulty technic.

The characteristics of the group are: non-spore-forming rods, ordinarily 0.2–0.5 by 0.4–1.0μ; Gram-negative; either non-motile or with one to a few polar flagella; gelatin or agar colonies ordinarily under 1 mm. in diameter; gelatin liquefaction either slow or absent; growth in liquid media either scanty or entirely lacking, but abundant on the surface of ordinary agar. It is closely related to the group described by Ayers, Rupp and Johnson as the "alkali-forming" bacteria of milk (U. S. Dept. Agr. Bull. 782).

The key to its classification proves to be the testing of fermentative or reducing activities and so forth, on agar slants instead of in liquid media. This technic shows the group to be a very diverse one.

The importance of the group is indicated by its abundance (ordinarily 70–80 per cent of all the colonies on soil plates being of this type) and by its fluctuations in numbers in soil. Its significance, however, is one of the greatest unsolved problems in soil bacteriology. It is hoped that the problem can be solved now that we have the key to the study of the group.—*Author's abstract.*

25. *Beneficial Results from the Inoculation of Canning Peas with Legume Bacteria.* WILLIAM H. WRIGHT.

The successful and profitable inoculation of canning peas in LaCrosse County, Wisconsin, in 1918 led to the rather extensive inoculation of canning peas in that part of the state in 1919. Since Wisconsin possesses as varied soil formations as any state in the Union the profitable growing of peas as a general crop involves many factors. There is no doubt that the growing of peas on the medium to light loam soils of the state is a profitable business. However the general practice of growing peas on the acid sandy soils and the sandy loams may not always be profitable. The successful inoculation of peas in 1918 was secured on one of the poor sandy soils. Such results and the development of what practically amounts to a cost system of furnishing cultures to the farmers by the Department of Agricultural Bacteriology of the College of Agriculture, is leading to inoculation as a general practice.

The general increase in the practice of inoculating canning peas on all types of soils led the Department of Agricultural Bacteriology in 1920 to make a study in the field, and in experimental plats, of the conditions which influence the inoculation of canning peas. The following conclusions are drawn from this work:

1. The factors which influence the practical results of the inoculation of canning peas are numerous and varied.
2. On acid, poor, soils lime and inoculation increase the nitrogen content and help the maturity of peas.
3. All strains of legume bacteria are not equally efficient on either poor or fertile soils. The strain of bacteria used may be a very important factor in the final results obtained.
4. The amount of inoculum used is a very important factor in securing the maximum effect of inoculation and can well be considered in the manner of applying cultures.
5. In fertile soils where peas have grown for several years in the regular crop rotation, especially if the soil is acid, the use of lime and an efficient strain of legume bacteria increases the yield of green plants, makes maturity of the crop more uniform, improves the desirable grades of peas, increases the yield of peas, increases the nitrogen content of the crop.—*Author's abstract.*

26. *A Comparison of the Technic Recommended by Various Authors for Quantitative Bacteriological Analysis of Soil.* ZAE NORTHRUP WYANT.

This paper deals with the technic recommended for the quantitative bacteriological analysis of soil as applied not only to the determination of total counts but also to the estimation of numbers in one or more physiological groups.

Tables are given showing the extreme divergence in the technic recommended by various authors which could result in nothing but wholly incomparable data.

The fundamentally important points of difference are taken up in order and discussed, with the result that the following points are suggested as worthy of attention should the standardization of quantitative bacteriological soil analytical methods be considered at any future time.

1. Not less than 10 grams of soil should be used in making the first dilution.
2. The initial dilution should not be less than 1:10 nor more than 1:100.
3. The soil if it contains considerable organic matter should be triturated in a mortar with a little of the diluting liquid.
4. In all cases, the weighed soil sample should be made up to the volume of the desired initial dilution by the addition of sufficient diluting liquid, e.g., for a 1:10 dilution, 10 grams of soil should be placed in the graduated flask, cylinder, etc., and sufficient diluting liquid added to bring the volume up to 100 cc.
5. Care should be taken in making further dilutions or in plating to transfer an aliquot of the soil itself, as nearly as possible.
6. The second dilution should contain not less than one-tenth of the amount of soil in the first dilution.
7. Numbers of microorganisms (total or otherwise) should be estimated on the basis of soil oven dried at 100°C. to a constant weight.—*Author's abstract.*

27. *Frequency of Ropy Milk Organisms in City Milk Supplies.* H. A. HARDING AND M. J. PRUCHA.

Under normal conditions milk left to itself quickly develops sufficient acid to curdle. This spontaneous souring of milk is so nearly universal that when any other change occurs it is attributed to something unusual in the flora.

Occasionally milk is seen which can be drawn out into threads. Ordinarily these threads break when only an inch or less in length, but in some cases the threads are fine and silky and more than a foot long. In extreme cases the milk takes on almost the consistency of a stiff, sticky dough and a cup of it may be inverted without spilling the milk.

There are at least 3 common and distinct types of ropy milk; (1) the ropiness produced in milk by the Bulgarian bacillus; (2) the ropiness in starters for butter making, resulting from the degeneration of the starter cultures; and (3) the ropiness which appears in sweet milk.

A number of organisms, differing in morphology and in culture characteristics, have been described in connection with each type of ropy milk. Ropiness of milk has been known for many years in all dairy countries and in many of them ropy milk is a recognized food. We consume large quantities of it as Bulgarian buttermilk.

While the souring of milk is almost universal, the development of ropiness is probably the next most common change. The increasing amount of care given to the production and handling of city milk is practically all directed toward preventing acid development. A part of this care, particularly holding the milk at low temperatures, favors the development of any ropy milk germs which may be present.

Recent observations made by the authors and by colleagues in commercial laboratories indicate that the germs of ropy milk are fairly common in commercial sweet milk. When this milk is allowed to stand quietly at low temperature these germs often develop small isolated areas of ropiness in the cream. Under commercial conditions, the presence of this small amount of ropy cream is ordinarily overlooked. With the development of distinct acidity, this ropiness developing in sweet milk tends to disappear. It is only when a large area of viscous cream develops early that the situation is ordinarily recognized and described as an outbreak of ropy milk.

The recognition of ropy milk organisms as a fairly common and normal part of the milk flora is apparently new and is of importance both from the scientific and practical standpoint.

The data of this study are given in Bulletin 228 of the Illinois Agricultural Experiment Station and in an article by the authors in Journal of Dairy Science, Volume 3.—*Authors' abstract.*

28. *Destruction of Germ Life by Steam.* M. J. Prucha and H. A. Harding.

In dairy business steam is extensively used for the destruction of germ life in the utensils. The jet steaming is the usual way of applying the steam. In this method the utensil is inverted over an open end of a steam pipe and the steam blown into it.

In a study upon this subject, about 1500 milk cans of 5-, 8-, and 10-gallon capacity were steamed. The amount of steam blown into individual cans was varied from 1.2 to 130 cubic feet of steam (under atmospheric pressure).

From the bacteriological study of the steamed cans it was found that when 12 to 15 cubic feet of steam were blown into each can the germ life in them was reduced to a negligible number. If such cans had been filled with milk, they would have added on the average less than 10 bacteria per cc. When 20 or more cubic feet of steam were blown into each can, they then added less then one bacteria per cc. of milk.—*Authors' abstract.*

29. *Dirt as a Source of Germ Content in Milk.* H. A. Harding and M. J. Prucha.

Dirt carries a germ content which varies with its origin and condition. The plate count of such dirt as sometimes enters milk varies from less than 1,000,000 bacteria per gram to material which occasionally approximates 2,000,000,000 per gram.

Under ordinary conditions the dirt in milk is derived mainly from the coat of the cow and enters the milk during the milking process.

As it enters the milk the dirt is usually quite dry and has a low solubility. The insoluble dirt may be recovered from the milk and may be accurately estimated or may be actually weighed.

In a series of observations on cows as dirty as are often found in practical dairies, the amount of dirt recovered from the milk amounted to approximately 10 mgm. per quart of milk. In this same milk there was an accompanying increase in bacterial plate count of approximately 15,000 per cubic centimeter. Accordingly, in these experiments the increase in bacterial count was at the rate of one and one-half billion germs per gram of dirt recovered.

The above noted experiments were made under conditions adding an excessive amount of dirt to milk. Since with the addition of this excessive amount of dirt the germ content was increased only 15,000 per cubic centimeter, it is evident that the amount of dirt ordinarily entering milk contributes less germ life than the limit set for certified milk.

A Bulletin of the Illinois Agricultural Experiment Station giving the details of these experiments is in preparation.—*Authors' abstract.*

30. *The Flora of Corn Meal.* Charles Thom and Edwin LeFevre.

In seeking possible causes for the well-recognized instability of corn meal, cultures show considerable numbers of molds and bacteria to be generally present. Among these the following species of molds were characteristic of many series of cultures: *Fusarium sp.*, *Aspergillus repens*, *A. flavus*, *A. tamari*, *A. niger*, *Citromyces* (or *Penicillium* section *Citromyces*) *sp.*, *Penicillium oxalicum*, *P. luteum* varieties, *Mucor sp.* and *Rhizopus nigricans*, and *Syncephalastrum sp.* together with various yeasts and yeast-like fungi. Among bacterial groups the colon-aerogenes group and lactobacilli were most abundant in fresh meal. Aerobic spore formers and micrococci were always present and persisted in the stored product.

Within the range of composition found in merchantable meals, no bacterial activity was detected. Only one grade of unbolted meal showed signs of mold development below 13 per cent of moisture. Above 13 per cent moisture, *Aspergillus repens* begins to be an active agent of spoilage somewhere between 13 and 15 per cent of moisture, varying with the form of milling practiced. Several other species of molds are active in meal containing 16 per cent moisture, and numerous forms, including some bacteria, develop when 18 to 20 per cent of moisture is found.

Many samples of corn are found to carry extensive infections with *Fusarium*, *Diplodia*, *Aspergillus repens*, or *Penicillium*, especially in the germinal area and in the tip of the kernel. These sections of the kernel are removed in varying degrees by different milling systems. The bolted meals examined show a corresponding reduction in count of viable organisms as shown by culture. Some experiments indicate that such infected areas, if left in the finished product, cause progressive deterioration even at water percentages.—*Authors' abstract.*

31. Yeasts in Pasteurized Cream Butter and Some Suggestions as to Their Probable Source. T. H. Lund.

Wort agar of the following composition (wort, 400 cc., tap water, 600 cc., agar, 15 grams) acidified with 4 cc. of sterile 5.0 per cent lactic acid per 100 cc. of medium immediately before plating, was found to be considerably superior to whey agar acidified with tartaric acid for the cultivation of yeasts and molds from butter.

A summary of the yeast content of 337 lots of Canadian creamery butter manufactured during June to October, 1920, from pasteurized cream, and all non-reactors to the Storch test, will be found in the following table:

YEAST COUNTS PER CUBIC CENTIMETER	93 DOMINION CONTEST LOTS JUNE, JULY, SEPTEMBER AND OCTOBER ENTRIES		244 ONTARIO LOTS JUNE, JULY, AUGUST	
	Number of samples	Per cent	Number of samples	Per cent
0–99	6	6.4	16	6.5
100–499	5	5.3	37	15.2
500–999	5	5.3	46	18.8
1,000–4,999	14	15.0	88	36.1
5,000–99,999	39	41.9	42	17.2
100,000 and over	24	25.8	15	6.1

Some explanation should be forthcoming to account for the presence of such large numbers of living yeast cells in butter made from pasteurized cream.

In the author's opinion the trouble is not so much due to survival of yeasts owing to low temperatures of pasteurization as it is to recontamination of yeast-free cream after pasteurization with yeasts from one source and another, but particularly from yeast-infected churns.

Neither thorough scalding with boiling water nor treatment with chloride of lime solutions of varying strength were effective in eliminating yeasts from churns.

Treatment with boiling hot freshly prepared milk of lime, along with occasional repacking of the stuffing boxes around the roller-worker pins, was effective in eliminating yeasts from churns so treated, and in reducing the yeast content of butter made in them to less than 10 per cubic centimeter. Recommendation is made that all churns should undergo the milk of lime treatment at least once a week.

No definite relation between the yeast content of butter and its flavor and keeping quality has been established up to the present time.—*Author's abstract.*

Fourth Session

Wednesday, December Twenty-ninth

PUBLIC HEALTH BACTERIOLOGY

32. Bacteriological Study of the Water of Lake Mendota. Frank C. Wilson.

The results of the study of the Wisconsin Geological and Natural History Survey on the water of Lake Mendota are: The stratification of the lake water during the summer months; the lack of free oxygen in the lower strata during this season; the "turn over" in the fall; and the movement of water currents carrying organic matter under the ice in late winter or early spring during slight "thaws."

The methods commonly used in a bacteriological study of water were tried but were found unsatisfactory. In this report, emphasis has been placed on the total number of bacteria rather than on the source and kinds of bacteria. Samples were taken at regular intervals, usually one week, from Lake Mendota and counts made of the number of bacteria in the water. The samples were taken from a fixed station approximately one mile from the shore. A description of the sampler used in this work is given in J. Bact., 1920, **5**, 103–108.

The number of bacteria varies according to the season, ranging from about 100 per cubic centimeter in winter to 3550 per cubic centimeter in early summer. Graduations occur in numbers in fall and spring between these extremes. No special consideration was given to qualitative work. Chromogenic colonies are numerous on the plates in summer and fall. Small white forms seem to predominate during fall and winter. In spring and early summer, soil forms, e.g., *Actinomycetes*, *Azotobacter*, and true denitrifiers were isolated in pure culture. From stained mounts of many colonies present on the plates, it was shown that 60 to 80 per cent of the organisms are small rods, 10 to 15 per cent are cocci, and 10 to 15 per cent are large rods.—*Author's abstract.*

33. Viability of the Colon-Typhoid Group in Carbonated Water and Carbonated Beverages. S. A. Koser and W. W. Skinner.

A study was made of the viability of *B. coli*, *B. typhosus*, and *B. Schottmülleri* (*paratyphosus* B) in carbonated water and in various types of carbonated beverages. It was found that, following experimental inoculation,carbonation causes a rapid diminution in the numbers of these organisms. The destructive effect of the CO_2 is more marked at room temperature, (19–22°C.), than at 1°C. *B. typhosus* and *B. Schottmülleri* are killed much more readily by CO_2 under pressure than is *B. coli*. The acidity of the dissociated CO_2, and not the pressure, *per se*, would seem to be the main factor responsible for the death of the bacteria.

As a matter of interest, the viability of several spore forms was also investigated. The spores of both *B. mesentericus* and *B. sporogenes* (Metchnikoff) were found to be quite resistant to CO_2, for they survived one month at room temperature with little or no decrease in numbers.—*Authors' abstract.*

34. Differentiation of the Paratyphoid-enteritidis Group by Means of the Disaccharide Trehalose. Stewart A. Koser.

In a study of the availability of trehalose for the various members of the paratyphoid-enteritidis group, it was found that *B. suipestifer* is unable to attack this disaccharide, whereas *B. paratyphosus*, *B. Schottmülleri*, the "animal paratyphoid B" type (probably identical to *B. aertryckei*) and *B. enteritidis* ferment trehalose with the production of acid and gas.

Furthermore, it is possible to differentiate the *B. Schottmülleri* strains from the closely allied "animal para B" cultures, hitherto separable only by serological methods. This has been accomplished by employing small amounts of a serum water medium containing 0.5 per cent trehalose and 1.0 per cent Andrade indicator. In this medium the "animal para B" strains produce a red coagulum after 3 to 4 days' incubation at 37°C., while the *B. Schottmülleri* cultures present a very light pink or colorless coagulum. *B. enteritidis* is similar in its reaction to the "animal para B" cultures and in contrast to *B. Schottmülleri.*—*Author's abstract.*

35. Bacterial Changes in Stored Normal Feces. E. O. Jordan.

In all instances the number of bacteria increases during the first few days of storage. A decline in numbers usually sets in within the first 2 weeks of storage but this is not invariable. The actual number after 2 to 3 months of storage is often less than the initial number in the fresh stool, but this is by no means always the case, and in more than one-third of the experiments the colony count was higher at the end of the storage period than at the beginning. The initial changes are especially interesting. The initial multiplication is due mainly, if not wholly, to an increase in the numbers of *B. coli*. This increase is sometimes enormous amounting to from two hundred to three hundred times the original number. It occurs at low and high temperatures (37°, 20°, 10°) and is hence not to be regarded as due to the temperature change occurring when the feces leave the body. It is evident that an inhibitory effect obtains in the lower intestine and that this is manifested even upon the characteristic microbe of the intestinal contents of that region.—*Author's abstract.*

36. The Mechanism of the Appearance of the Russell Double Sugar Tube with the Typhoid Group. Henry J. Nichols.

The explanation of the appearance of the Russell double sugar tube with the typhoid group, as given in the original description and repeated elsewhere, is as follows:

"The entire point of the medium rests upon the difference in changes produced by the growth of the typhoid bacillus under aerobic and under the imperfect anaerobic conditions found in the butt of the tube, where the bacillus obtains its oxygen by breaking down the glucose with the liberation of considerable acid; on the surface, however, in the presence of free oxygen, no acid is formed."

In this explanation no place is found for the fact that the typhoid bacillus ferments glucose with acid end products under both aerobic and anaerobic conditions. It occurred to the writer that the glucose might be fermented in the slant as well as in the butt and that the small amount of acid formed from the 0.1 per cent glucose might volatilize and leave the medium apparently unaffected. In order to test this hypothesis several experiments were made with results which support this explanation.—*Author's abstract.*

37. Practical Laboratory Diagnosis of Typhoid Fever. Aubrey H. Straus.

The blood culture has proved to be a practical laboratory procedure of great value. We now examine these as a routine, supplying a regular outfit as for other tests.

Summary of 386 blood cultures made in routine municipal work:

Negative	294
Positive	78
Unsatisfactory	14

The positive cultures were as follows:

Typhoid	62
Streptococci	5
Paratyphoid	4
Pneumococci	2
Unidentified bacilli, probably paratyphoids	2
* Hemolytic, Gram-negative bacillus, unidentified	1
Meningococcus	1
Influenza bacillus	1

* This culture was not a contamination as three different cultures proved its presence.

We also supply a simpler blood culture outfit for state work which can be mailed.

Summary of 39 blood cultures made in state work:

Negative	23
Positive typhoid	15
Unsatisfactory	1

The microscopic Widal test carried out with the dried drop of blood has proven very unsatisfactory.

The macroscopic Widal test with sufficient blood for accurate dilution has given excellent results in practical, routine work.

Table showing comparative tests by the macroscopic and microscopic methods on 40 specimens of blood

MACROSCOPIC TEST	MICROSCOPIC TEST			
	Positive	Negative	Atypical	Total
Positive	7	4	7	18
Negative	—	20	2	22
Atypical	—	—	—	—
Total	7	24	9	40

Previous vaccination is not as likely to mislead as often thought, but should always be considered in interpreting results. The titre of the patient's serum is important.

Conclusions.

1. The dried drop Widal test should be discontinued as it is unreliable and more misleading than helpful.
2. The blood culture is a very valuable test, not only for ideal conditions as are found in a hospital, but also as a regular routine procedure. It has proved to be entirely feasible in municipal work and will probably prove so in state work where the specimens are not received so promptly.
3. The macroscopic Widal test is simple, practical and reliable. When used in conjunction with the blood culture we have a laboratory procedure which will seldom if ever mislead. This test should be a part of every diagnosis laboratory.
4. Stool examinations should be available when needed.—*Author's abstract.*

38. A Standard Technic for the Widal Reaction. Clyde R. Madden.

Since the Widal reaction was first applied for the diagnosis of typhoid fever it has been modified several times, but no modification has yet been generally adopted. The purpose of this paper is to suggest a standard technic.

The cultures should be freshly grown agar slants not over 24 hours old, preferably 18. These should be emulsified in about 1 cc. salt solution.

The patient's blood is collected in a sterile test tube or other suitable receptacle (Keidle has devised a vacuum bulb that is very useful in this work). A sufficient amount is collected to yield about 1 cc. of serum. Serum is separated from cells by centrifuging or allowing the blood to clot.

Accurately graduated pipettes of 0.2 cc. capacity graduated in 0.01 cc. for this work can be obtained from dealers in laboratory supplies.

Fifteen chemically clean and sterile serological test tubes are placed in the rack; the first 5 are labeled "para A;" the second 5, "para B;" the third 5, "typhoid." The first tube of each set now receives 0.8 cc. salt solution; the second tube of each set receives 0.85 cc. salt solution; the third, fourth and fifth each receives 0.9 cc. salt solution. Each tube of the para A series now receives 0.1 cc. of the para A culture; each tube of the para B series receives 0.1 cc. of the para B culture and each tube of the typhoid series receives the same amount of the typhoid culture. The first tube of each set now receives 0.1 cc. of the patient's serum; the second tube 0.05, the third receives 0.02 and the fourth 0.01. This gives dilutions of 1:10, 1:20, 1:50, 1:100, and a control for each series. All tubes are now shaken well and put in the incubator or water bath for one hour and observed at intervals of 15 minutes for agglutination. If no agglutination is observed at the end of an hour they are put in the ice box and kept for 12 hours and observed at intervals of 2 hours for agglutination.

This technic has been used exclusively (except for infants) in hospital work for the past two years, and it has given absolutely satisfactory results.—*Author's abstract.*

39. *The Effect of the Reaction of Media upon the Morphology of the Diphtheria Bacillus.* R. L. LAYBOURN.

Bunker (Abs. Bact., 1917, **1**, No. 11) reported that the reaction of beef broth medium had a definite bearing on the morphology of *B. diphtheriae*. Since considerable emphasis is placed upon morphology in the laboratory diagnosis of diphtheria, a study of the effect of the reaction of Loeffler's blood serum medium upon the morphology of the diphtheria bacillus was undertaken.

The blood serum used in the preparation of Loeffler's blood serum medium is usually collected in large quantities and preserved by the addition of an excess of chloroform. This inhibits the action of bacteria but does not interfere with enzyme action. Serum preserved in the above manner for different lengths of time gave reactions varying from pH 6.1 to pH 7.5. It was also found that different specimens of blood serum mixture adjusted to a slight alkalinity to litmus in accordance with the old standard formula, showed wide variations in reaction.

Specimens of uncoagulated Loeffler's blood serum mixture were adjusted to reactions of pH 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, and coagulated and sterilized in the usual manner. The change in reaction did not appear to be more than 0.2 of a unit of pH, the final reaction being determined by the addition of indicators to the medium before coagulation and by the reaction of the water of condensation in tubes of coagulated medium.

Three typical granule producing strains of *B. diphtheriae* of known virulence were used in the preliminary studies. The media of various reactions were inoculated with actively growing cultures of these strains, and the morphology studied after 24 hours' incubation at 37.5°C. The cultures on the medium having reactions of 7.0 and 7.5 showed the longest forms and the largest percentage of granule formation. There was proportional decrease in length and percentage of granule formation in both the alkaline and acid cultures. The very acid media showed small, irregular forms with few granules. The very alkaline media showed minute, triangular forms with few or no granules. The cultures grown on media of intermediate reaction between neutral and very acid and neutral and very alkaline showed a considerable number of barred forms.—*Author's abstract.*

40. *An Investigation into the Purity of Strains of Bacillus botulinus Obtained from Different Sources in this Country.* GEORGE F. REDDISH AND LEO F. RETTGER.

Non-toxic strains of an anaerobe were isolated from 18 out of 19 so-called strains of *Bacillus botulinus* examined. These non-toxic strains presented all of the known characteristics of *Bacillus sporogenes*. Attempts to obtain pure cultures of a toxic strain were unsuccessful, if Van Ermengem's description of *B. botulinus* is accepted. All cultures, whether toxic or non-toxic, attacked meat with the production of foul, putrefactive odors. The isolation of *B. sporogenes* from the stock cultures was accomplished by 4 different methods; namely, by anaerobic plating, by simple dilution, by aerobic plate culture with *Staphylococcus aureus*, and by the heating of young cultures in which *B. botulinus* had not yet attained the spore stage, but which contained fully developed spores of *B. sporogenes*.

While attempts to isolate toxic strains of *B. botulinus* were apparently unsuccessful, certain important differences were established between the toxic and non-toxic "strains," aside from toxicity. The toxic isolations, like the original stock cultures, fermented glucose, levulose, maltose, lactose, and sucrose, with gas production, while the non-toxic attacked only the glucose, levulose and maltose.

Difficulty in isolating pure *B. botulinus* in this country has been due largely to the presence of an organism which grows rapidly and readily under almost all cultural conditions, namely *B. sporogenes*, whereas the organism of Ermengem is slow to develop from single cells, at least on agar surface, and hence is easily overshadowed by the contaminant. Furthermore, the general practice of employing deep agar tubes in this country for isolation of the anaerobe is in itself faulty, as it permits of contamination much more readily than the surface colony isolation technic.

The presence of *B. sporogenes* as a contaminant in cultures of *B. botulinus* obtained from the various sources in this country will explain the sharp differences noted in the descriptions of this organism by European and American investigators. It should also account for the variability in the toxicity of American strains of this organism, to which reference has so frequently been made. If *B. botulinus* is associated with *B. sporogenes* it must be assumed that the proportion of these two organisms varies markedly from day to day. When the former is abundant the toxicity is high; when *B. sporogenes* greatly predominates, the culture may possess little toxicity. This question also has an important bearing on the production and use of antitoxin for the treatment of botulism victims.—*Authors' abstract.*

41. *Variations in the Morphology of the Diphtheria Bacillus Due to Age.* HENRY ALBERT.

This work was done chiefly with pure cultures,—125 in number. Smears were made from cultures (using different tubes) varying from one hour to one month in age. A highly selective granule stain (toluidin-blue-iodine) was employed.

The following alterations in morphology were noted:

1. Size. Slight increase for the first 4 hours, maintenance of this size for about 20 hours; rapid diminution after the 24-hour period. At the end of 7 days, the average length was only about one-third the maximum.

2. Shape. Young bacilli are rather bluntly pointed. With the development of granules, the ends become more rounded—even bulging. With the disappearance of granules in the process of disintegration, the bacilli become irregular in shape with end again more pointed.

3. Internal structure—Granules. Young bacilli stain solidly. After a few hours the protoplasm of some gathers in masses which take a heavier stain than the intermediate portions—producing a barred appearance. Granules (metachromatic) appear in cultures 4 to 8 hours old. These are at first of small size. Granules attain their largest average size in cultures 12 to 15 hours old. After this period the granules diminish in size and disappear.

The percentage of bacteria which contain granules increases rapidly from the 4-hour period when there are but few granules to the 12-hour period when 91 per cent contain granules. At the end of 2 days most of the bacilli have lost their granules.—*Author's abstract.*

42. *Studies on Pleomorphic Streptococci.* John F. Norton, Katherine Rogers and C. Georgieff.

Pleomorphic streptococci, as found in the human mouth, do not constitute a homogeneous group but include hemolytic and "green" producing types with a variety of cultural and serological reactions. Pleomorphism is the result of an unfavorable environment and is not related to pathogenesis. All the authors' strains of mouth streptococci developed pleomorphism when kept on artificial media for a sufficient length of time.—*Authors' abstract.*

43. *Studies upon Streptococcus. II. Cultural Versus Biological Classification.* C. Roos and E. May Gray.

The importance of bacteriologic methods in the diagnosis of disease is fully recognized and its treatment by immunologic means definitely established. To meet the requirements of our present day needs, any system of classification of the pathogenic microorganisms, must be equally satisfactory to both the bacteriologist and the immunologist.

The older cultural methods are inadequate for the classification of certain types of pathogenic microorganisms, notably streptococci. The due importance of biologic classification has not been sufficiently recognized.

As regards the effect on red blood cells, it is considered that hemolysis or methemoglobin production occurs to some degree with all strains of streptococci and therefore a fast line of demarcation on such basis is impossible.

In the agglutination test of streptococci interreactions between the hemolytic, viridans or non-hemolytic strains occur frequently. It is suggested that there exists a relationship between the strains of streptococci similar to that of the typical and atypical strains of Type II pneumococci.—*Authors' abstract.*

Fifth Session

Wednesday, December Twenty-ninth

COMPARATIVE PATHOLOGY

44. *Efficiency of the Agglutination Test for Contagious Abortion of Cattle.* D. H. Jones.

An estimate of the efficiency of the agglutination test for contagious abortion of cattle, based on a comparison of the results of the test with the previous history of the animals tested, was made on two herds of pure bred cows, a beef herd and a dairy herd.

The beef herd included 21 breeding cows 2 years old or over, 3 yearlings not bred, and 8 calves. The results of the test on this herd are as follows:

Breeding cows, positive reaction with history of abortion	8
Breeding cows, negative reaction with no history of abortion	4
Value of test confirmed by	12
Breeding cows, positive reaction with no history of abortion	8
Breeding cows, negative reaction, with history of abortion	1
Value of test negatived by	9

Thus the efficiency of the test as shown by the above figures is as 12 to 9, a percentage efficiency of 57.

Two yearlings gave a positive reaction, the other yearling and all the calves were negative.

The dairy herd comprised 29 breeding cows 2 years old or over and 5 yearlings not bred. The results of the test on this herd are as follows:

Breeding cows, positive reaction with history of abortion	2
Breeding cows, negative reaction with no history of abortion	19
Value of test confirmed by	21

Breeding cows, positive reaction with no history of abortion	3
Breeding cows, negative reaction with history of abortion	1
Value of test negatived by	4
Breeding cows, doubtful reaction, no history of abortion	4
Yearlings not bred, negative reaction	3
Yearlings not bred, positive reaction	1
Yearlings not bred, doubtful reaction	1

Leaving out of consideration the doubtful reactors and yearlings, and estimating the value of the test on the same basis as for the beef herd, we find the efficiency of the test of this herd to be as 21 to 4, or a percentage efficiency of 84.

As in both herds abortion had been occurring for many years, and the animals mixing freely, it is probable, though not yet bacteriologically established, that the animals that gave a positive reaction but showed no history of abortion, had become infected with *B. abortus* and were possibly carriers and disseminators of the organism. Such a conclusion is largely warranted by the published reports of other investigators.

In view of this consideration the percentage efficiency of the agglutination test for contagious abortion of cattle, as represented by the above figures, is probably much below its actual value when used for determining which animals in a herd are likely to be dangerous as disseminators of the disease.—*Author's abstract.*

45. Infection of Swine by Bact. abortum of Bang. H. M. Weeter.

Tests were made on the blood of 517 swine to determine the presence of agglutinins for *Bact. abortum* of Bang. Specimens were collected at the time of the bleeding of the animals at several of the large packing houses at the Union Stock Yards. The serum was agglutinated against a typical bovine strain of the organism, the first readings being made after 2 hours at 37°C. and the final readings after the suspension had been held over night in the ice box. Of the total number examined, 369 samples were from sows and 148 were from barrows. Of 369 specimens of sows' blood, 60 or 16.2 per cent gave a positive agglutination in a dilution of 1:50 or higher. Of these 60 findings, 36 or 9.7 per cent were in a dilution of 1:100 or higher. These 36 specimens that agglutinated the antigen in a dilution of 1:100 or higher gave the following results:

NUMBER OF SAMPLES	DILUTION	RESULTS
8	1:100	Partial agglutination
8	1:100	Complete agglutination
15	1:200	Complete agglutination
3	1:400	Complete agglutination
1	1:600	Complete agglutination
1	1:800	Complete agglutination

Of 148 specimens of barrows, blood tested, 7 or 4.7 per cent agglutinated the antigen in a dilution of 1:50 or higher and of these there was one specimen which gave a positive result in a dilution of 1:100 and one in a dilution of 1:200.

Following this work, an examination was made of a large number of gravid and non-gravid swine uteri obtained fresh from slaughtered animals, for the presence of *Bact. abortum.* From two uteri, showing signs of recent parturition, *Staphylococcus aureus* was isolated and from two others of a similar nature, cultures were isolated identical in their cultural, agglutination and absorption reactions with *Bact. abortum* of bovine origin. In a pregnant uterus carrying apparently normal embryos of about 18 mm. size, one embryo was found that had undergone regression and was partially macerated. From this material also was isolated a pure culture of *Bact. abortum.*—*Author's abstract.*

46. The Importance of an Increased Carbon Dioxide Tension in Growing Bact. Abortum (Bang) I. F. Huddleson.

By means of the hydrogen-ion concentration method, the author made a study of the atmosphere in tubes containing agar slant cultures of *B. subtilis* and *Bact. abortum,* and found that there is developed in the contained atmosphere an increased CO_2 tension instead of a decreased O_2 tension as formerly believed. The increased CO_2 tension greatly stimulates the growth of *Bact. abortum.* The CO_2 change in the atmosphere of the tube is determined by the pH change (in color) in an additional connected tube containing a sterile buffered solution of brom-thymol blue broth (pH 7.0). Chemical means were substituted for producing the CO_2 gas. The correct percentage, by volume, necessary for the growth of *Bact. abortum* was found to be 10 per cent. Luxuriant growth may be obtained from infectious material, including infected milk, in 24 to 48 hours' incubation at 37°C. The description and diagram of an apparatus for collecting the CO_2 gas is also given.—*Author's abstract.*

47. *A Study of an Organism Isolated from Cases of Nephritis in Sheep.* C. P. FITCH AND D. C. BEAVER.

Nephritis is an uncommon disease among sheep. The organism which was isolated is a small, non-motile rod. Its action on the carbohydrates has been carefully studied. It is non-pathogenic for rabbits and guinea pigs. Nephritis has been induced in sheep by inoculation. This organism is apparently somewhat closely related to the one originally described by Meyer from South Africa, and named by him *Bacillus nephritidis*, and called by Magnusson *Bacterium viscosum equi*. The organism isolated from sheep has been named *Bact. nephritidis* var. *ovis*.—*Authors' abstract.*

SIXTH SESSION

Thursday, December Thirtieth

IMMUNOLOGY

48. *The Sensitiveness of Leucocytes to Acid, as Indicated by Their Phagocytic Activity in Vitro.* ALICE C. EVANS.

Leucocytes exert on slightly acid solutions the same kind of a buffer action as blood serum. Leucocytes which have undergone a chemical change as a result of the absorption of free H-ions, show an impaired capacity for phagocytosis proportional to the extent of the chemical change. In order to obtain reliable results with the test for phagocytosis promoting antibodies in immune serum, it is necessary to avoid exposing the leucocytes to acid solutions. The sodium citrate produced by some chemical firms contains enough acid to injure the leucocytes when used in preparing the suspension for the phagocytic test.—*Author's abstract.*

49. *The Titre vs. the Fixability of Complement.* R. L. KAHN AND E. D. WHITE.

The claim of various workers that some complements of good hemolytic titre are incapable of being fixed by serum and antigen has not been substantiated in this laboratory. The hemolytic titre and fixability of 370 guinea pig complements were determined without finding any non-fixing sera. A large number of guinea pigs were re-bled from time to time, the total number of different pigs being 140.

Our results indicate that the reasons why good hemolytic complements apparently do not possess any fixing powers are the employment in fixability tests, first, of an average dilution of complement, such as 1:10, instead of a carefully titrated number of units; second, of weak positive sera; third, of water-bath instead of ice-box fixation (4 hours).

We have observed again and again that complement of high titre used 1:10 in the fixation tests (instead of 2 units), gave practically negative results with positive sera. This was particularly true when comparatively weak positive sera were employed and the fixation tests were carried out in the water bath instead of the ice-box. When two units of complement were employed in the fixation tests, every complement possessing a reasonable hemolytic titre, showed fixation with positive sera.—*Authors' abstract.*

50. *The Rate of Destruction of the So-Called Syphilitic Antibodies by Heat.* R. L. KAHN AND A. G. BOYD.

Noguchi has found that heating syphilitic sera for 20 minutes at 56°C. reduces the antibody content to about one-fourth. This finding has not been substantiated in this laboratory when employing an alcoholic antigen of beef-heart and a cholesterinized antigen of pig-heart.

When water bath fixation (½ hour) was resorted to, a gradual disappearance of syphilitic antibodies was noted. This disappearance was comparatively slight after 5, 15, 30 and 60 minutes' heating at 56°C. With strong positive sera the loss of antibodies amounted to about 5 per cent. With weak positive sera, the destruction of antibodies amounted in some cases to 50 per cent after 30 minutes' heating at 56°C. When the sera were heated to 62°C., the loss of antibodies often amounted to 100 per cent.

An altogether different picture was observed when fixation was carried out for 4 hours in the ice-box. Most sera tested showed a tendency to be somewhat stronger rather than weaker after heating. A small per cent of weak positive sera showed after heating an apparent increase in antibodies amounting to about 75 per cent.—*Authors' abstract.*

51. *Vaccines and Serums in Coccus Infections.* CHAS. B. MORREY.

Gram-positive cocci, staphylococci, streptococci and pneumococci are universal parasites. We are constantly interchanging these organisms and may exchange virulent ones. They are usually harmless but may become virulent. Gram-negative cocci are occasional parasites only. Coccus infections are usually localized, but may become generalized. One attack of a coccus infection is considered not to confer immunity. This may be explained by the fact that they are so frequently localized. Whether general coccus infections confer immunity or not remains for future observation and research. Animals may be easily immunized against coccus infections, probably man can be also.—*Author's abstract.*

62. *Antibody Studies. Part II. Solution of Antibody; Potency—Experimental and Clinical.*
F. M. Huntoon.

In November, 1919, Part I of these studies was reported before the Pathological Society of Philadelphia and in the following month a brief summary was given before the annual meeting of the Society of Bacteriologists.

The present report covers the subsequent advances made in the determination of the factors governing the reversal of the antigen-antibody reaction and methods of obtaining highly potent solutions of antibody by the removal of such bodies from bacteria sensitized with immune serum.

Influence of Inorganic Salts. Different inorganic salts apparently act as a binder in different antibody-antigen combinations.

The presence of sodium chloride inhibits to a considerable degree the separation of agglutinins from sensitized bacteria while not influencing such separation of bactericidal antibodies or the protective antibody derived from antipneumococcic serum.

The protective antibody, however, is influenced by the presence of calcium phosphate or calcium sulphate, consequently the dissociation of this antibody from its combination with antigen does not occur readily in normal serum (owing to its content of calcium phosphate) unless the calcium salts are precipitated out by the addition of potassium oxalate.

The dissociation phenomenon is apparently dependent on the dilution of these binding salts.

Influence of Sensitization Methods. The production of highly potent solutions depends directly upon adequate methods of sensitization, the antigen must be saturated with antibodies.

Relation of Antibody so Obtained to Serum Proteins. Such solutions while not giving tests for serum protein by chemical means, do in a certain proportion of cases induce a state of serum sensitiveness in guinea pigs when given in 5 cc. amounts.

This small amount of protein is probably neither antibody nor associated with antibody since bacteria absorb a certain amount of protein from *normal* serum.

Antibody in such solutions is remarkably resistant to deleterious influences, even resisting the action of trypsin over considerable periods, which indicates that it is different in nature from the serum globulins, although antibody is colloidal in nature, not being dialyzable.

Solutions of pneumococcus protective antibody have been obtained approaching in value the best of the immune sera, protecting against 1 million fatal doses of Type I, II, or III.

Such solutions polyvalent for Types I, II, and III have been employed clinically in lobar pneumonia with striking results in the cases of the three types, and with favorable effects even in Type IV, especially when used early in the disease.

The reports of cases treated with antibody solutions will be made independently at a later date, by those engaged in testing the clinical value of the material.—*Author's abstract.*

63. *Horse Serum Protection against Diphtheria Inoculation.* Henrietta Calhoun.

Studies on guinea pigs show that 1 cc. of normal horse serum given intracardially will protect guinea pigs from death after a subcutaneous injection of a virulent culture of diphtheria bacilli. This protection occurs when the horse serum is given from 48 hours preceding to 4 hours post diphtheria inoculation. Horse serum gives the characteristic blood picture of a nonspecific protein reaction. Egg white which gives a protein reaction in guinea pigs also offers protection but of less degree than normal horse serum. Typhoid vaccine and peptone solutions which do not give a cellular response in guinea pigs give no protection.

The nonspecific protein factor is probably in part responsible for the protection afforded by horse serum, but there is also another factor—that of the antitoxin equivalent of 1 cc. of horse serum. The serum used was found to have an antitoxin equivalent of between 2 and 3 units of antitoxin per cc. when tested by an L+ dose of diphtheria toxin. Although 2 to 3 standard units of antitoxin measures the antibody equivalent of 1 cc. of normal horse serum the protection it affords is greater than that afforded by the injection of 3 standard units of antitoxin and is equal to the protection afforded by 6 standard units of antitoxin. Consequently the immune factors involved in the protection against virulent diphtheria organisms afforded guinea pigs by horse serum are two; first the antitoxin equivalent of the horse serum, and second the nonspecific protein reaction in the guinea pig which may be measured by the leucocyte increase in the blood. This in no way shows that horse serum treatment is a substitute for antitoxin; on the contrary, it emphasizes the value of antitoxin in diphtheria intoxications.—*Author's abstract.*

64. *The Effect of Bacterial Proteins upon Intestinal Loops of Normal and Vaccinated Animals.*
Noble P. Sherwood and O. O. Stoland.

The authors reviewed and confirmed the work of Shultz and Dale using soluble proteins such as egg white and blood serum. They then studied the effects of various and comparable amounts of bacterial proteins upon 30 mm. loops suspended in oxygenated tyrode solution kept at 38°C. Bacterial protein in the form of living suspensions, dead suspensions, autolyzed extracts and old broth cultures were used. They report that intestinal loops from normal guinea pigs, when treated with a reacting dose, quite uniformly responded with a rise in tone and temporary decrease in contractions. Intestinal loops from normal rabbits were much more refractory to both bacterial and soluble proteins and in one instance responded with a drop in tone when whole blood was added. This also occurred occasionally when the tyrode solution was changed.

Using intestinal loops from vaccinated animals they report that one guinea pig seemed to give a single and apparently specific response to the bacterial protein, as found by Shults and others for egg white. The loops from the other vaccinated guinea pigs seemed to have about the same threshold for stimulation as normals, but on the whole, responded with a greater intensity than normals. The response was apparently nonspecific. The intestinal loops from rabbits were more refractory, the inhibitory mechanism being frequently stimulated. This latter result occurred with one exception in loops from vaccinated animals.

The authors mention that their results may be partly or even wholly due to products of metabolism present even in bacterial suspensions washed from agar plates. Such suspensions are commonly used, however, in the routine manufacture of vaccines. This point is being investigated at the present time.

They feel that the almost negative results, in so far as specificity is concerned, may be explained upon the basis of the small amount of bacterial protein in actual solution and the slowness with which it goes into solution.—*Authors' abstract.*

55. *Studies on Sensitized Bacterial Vaccines. I. Passive Immunity as Conferred by Sensitized Bacterial Vaccines.* M. A. Corsa S. H. Craig and A. N. Richards.

This study demonstrates that, so far as protective antibodies are concerned, sensitized pneumococci carry a charge which, upon injection, becomes split off to the extent of conferring a certain immediate passive immunity. Following the injection of a single dose of such sensitized pneumococci, protective antibodies, actively produced, appear at about the time when they can be demonstrated following a similar dose of unsensitized pneumococci.—*Authors' abstract.*

56. *Studies on Sensitized Bacterial Vaccines. II. Detoxication of Bacterial Vaccines by Means of Sensitization.* M. A. Corsa and T. S. Githens.

Various organisms have been sensitized with their homologous immune sera and it has been found by the use of massive doses of sensitized and unsensitized material that a marked difference in reaction, both general and local, occurs. The dose used was 3.5 cc. per 250 grams of body weight injected subcutaneously into guinea pigs, using a suspension of 10,000 million per cubic centimeter. Both the general condition of the animals and local reactions were followed from day to day. The results of this study show that sensitization reduces the power of killed bacterial suspensions to produce severe reactions and also hastens the return of the tissues to normal condition.—*Authors' abstract.*

Seventh Session

Thursday, December Thirtieth

HUMAN PATHOLOGY

57. *An Experimental Study of the Latent Syphilitic as a Carrier.* Frederick Eberson and Martin F. Engman.

The object of this investigation was to determine the infectivity of lymphatic glands, semen, blood, spinal fluid, nasal washings and tonsils in latent syphilitics. Post mortem testes were studied in too few instances to merit a report at this time. The cases were grouped in accordance with a classification of latency which was devised with a view to include all possible sources of suspicious material. This group comprised those who had never received any treatment as well as those who had and included negative as well as positive blood Wassermanns. Out of a total of 500 luetics, 75 definite latent cases (15 per cent) could be selected during the year. From the time when first symptoms were noticed according to the patient's history, and the date of obtaining specimens, from 1 to 40 years had elapsed, so that the groups examined represented all stages of latency.

Rabbits were used in the inoculation experiments. Fluid materials, such as blood, semen, spinal fluid and nasal washings were injected intratesticularly in amounts of 1.5 to 2 cc. The other materials were first macerated and suspended in a small amount of salt solution, filtered through gauze and injected similarly by inoculating along the long axis of the testis and expelling the material as the needle was being withdrawn slowly. All materials, with the exception of a series of bloods which were incubated for periods varying from 3 days to 4 months, were injected in about 15 minutes to ½ hour from the time they were obtained.

The inoculated rabbits were examined carefully at frequent intervals within 3 weeks after injection. Dark-field examinations of the testicular fluid material were made at least every 2 weeks, even when no visible changes occurred, in order to safeguard against missing minute lesions in the body of the testes. Observations were continued over a period of 8 months and in many instances for a year. Animals which have remained negative to date are still under observation. The testes, liver and spleen of negative animals must be shown by inoculation experiments to be free of spirochetes before being reported as negative.

Fourteen inguinal glands from as many patients were inoculated, with 3 positive results—2 female patients and 1 male. Of this series, 3 rabbits died within 3 months after inoculation, showing no signs of infection. The strains produced typical syphilitic lesions in rabbits' testicles and could be recovered and propagated for an indefinite number of generations.

The incubation periods in the spirocheta isolated were respectively 50, 54 and 133 days, the last being doubtful owing to an early secondary infection in the experimental animal. In one instance, patient gave history of syphilis dating back 11 years, and in two instances, 1 year. Inoculations with the blood experiments from these 3 patients resulted negatively.

Seventeen specimens of semen were inoculated from different patients with 2 positive results. Of this series, 4 rabbits died within 1 month and 2 within 3 months after injection, showing no signs of syphilis. In one instance, history of syphilis dated back 13 years and in other, 1 year. The blood from these patients was injected with negative findings.

A total of 73 specimens of blood were examined with negative results. A series of 36 specimens, defibrinated and duplicating a number of the entire group, was incubated for a period of 3 days to 4 months and likewise found negative after injection.

Thirty-one specimens of spinal fluid were injected and found negative. The blood showed lymphocytosis in 10 cases with a negative Wassermann reaction in all but one instance. The corresponding blood Wassermanns were positive in all but 2 instances and in these the cell count was less than 8.

Injections with 24 specimens of nasal washings resulted negatively. Owing to the highly infectious nature of the secondarily invading organisms in tonsils, it was impossible to make an intensive study of such material.

Emulsions from the tonsils of 6 different patients were inoculated. The experiment animals did not survive more than 4 days after inoculation.

As far as studies with these different strains have progressed, there is no indication that the *Spirocheta pallida* has lost in virulence for the rabbit.

It appears that the blood and other body fluids, except semen, are not infectious in latent syphilis, or if so, but rarely.

Incubation of blood from latent syphilitics did not favor any infectious property which might have existed.

One-third of the total number of spinal fluids from latent syphilitics evidenced lymphocytosis and one gave a positive Wassermann reaction.

These investigations demonstrate the fact that those individuals who give a history of an old syphilitic infection may harbor active virulent *Spirocheta pallida* for years, and this, in the face of irregular negative Wassermann reactions or a slight reaction in the cholesterin antigen only.

General summary

SOURCE OF MATERIAL	NUMBER INJECTED	POSITIVE INOCULATIONS
Blood	73	0
Blood (incubated series)	36	0
Spinal fluid	31	0
Nasal washings	24	0
Inguinal glands	14	3
Semen	17	2
Testes (post mortem)	2	0
Tonsils	6	0*

* Experiments incomplete.

—*Authors' abstract.*

58. *Transformation of the Intestinal Flora of Man.* HARRY A. CHEPLIN AND LEO F. RETTGER.

Within the past year numerous experiments have been conducted on man with a view to implanting *Bacillus acidophilus* in the intestine, as had been done in the albino rat, either by special carbohydrate feeding or by the administration of cultures of *Bacillus acidophilus*, or with a combination of these two. The results thus far obtained permit of the following conclusions.

Thorough implantation may be effected by the daily administration of 300–400 grams of lactose or dextrin, 300 cubic centimeters of a whey broth culture of *Bacillus acidophilus*, or by a combination of 150 grams of lactose and 150 cc. of the bacterial culture. Transformation was also accomplished by the daily use of 500–1000 cc. of *B. acidophilus* milk. In fact the use of the milk culture proved to have certain advantages over the other methods, in that it stimulated change in bacterial types within the intestine more quickly and perhaps even more effectively than the feeding of the carbohydrates or the whey broth culture, and in that it appeared more practical and logical than either of these two methods. In two of the subjects 500 cc. of the acidophilus milk brought about marked alteration of the flora within 2 to 3 days. All of the subjects responded readily to 1000 cc. of the milk. A ready response was obtained also by the daily administration of 500 cc. of the milk and 100 grams of lactose.

Attempts to implant *Bacillus bulgaricus* in the intestine of man failed in every instance. The conclusions arrived at in the rat feeding experiments are fully supported here.

No change could be detected in the hydrogen-ion concentration of the feces of subjects in whom the establishment of *Bacillus acidophilus* was being brought about by the use of lactose. The change from the usual to the aciduric type cannot be ascribed, therefore, to increased acidity within the lumen of the intestine.

The presence of a reducing substance in the feces of subjects receiving transforming doses of lactose is evidence in support of the earlier claims that the carbohydrate is in part carried to the large intestine and helps to create a favorable environment there for the development of *B. acidophilus*.

The same methods were employed in the routine examination of the feces as in the experiments with rats, namely the use of whey-agar plates, Veillon tubes and Gram-stained slides. The plates and the Veillon tubes were particularly valuable, and are strongly recommended for work of this kind. The Veillon tubes aided not only in the detection of *B. acidophilus* colonies, but served as an admirable index of the disappearance of *B. coli* and other gas-producing organisms from the intestine. It soon became evident that as the aciduric type of bacterium materially increased in numbers the amount of gas in the tubes correspondingly decreased. A so-called complete transformation of flora was evidenced by the crowding of the whey-agar plates with the characteristic small fluffy colonies, the absence of gas from the Veillon tubes, and by a complete preponderance of acidophilus-like colonies throughout the tubes. Furthermore, there was a direct correlation between these findings and the large numbers of Gram-positive, rod-shaped organisms of the *B. acidophilus* type on the stained slides.—*Authors' abstract.*

59. Hemolytic Influenza Bacilli. T. M. Rivers and Erida L. Leuschner.

Several different workers have mentioned finding in throat cultures Gram-negative, non-motile, aerobic, hemolytic, hemoglobinophilic bacilli. These organisms have never been classified and the object of the present paper is to show, if possible, that they should be called hemolytic influenza bacilli.

Thirteen strains were partially studied and 5 were completely studied. All were hemoglobinophilic; their growth was inhibited markedly by fresh human blood; all formed nitrites; 3 of the 13 formed indol; the 5 studied in blood milk mixtures produced alkali; all were non-motile; all were Gram-negative; none formed spores; the colony formation was very similar to that of the non-hemolytic group. Some were morphologically exactly like the bacilli of the non-hemolytic group, others were slightly larger, squarer-ended and stained somewhat more deeply than the non-hemolytic ones. They produced the beta-type of hemolysis, and free hemolysin was thought to be demonstrated. They fermented certain sugars and in this respect do not differ so materially from the non-hemolytic group. From the above description there is no marked reason, except the hemolysis, why these organisms should not be called hemolytic influenza bacilli. One of the 13 strains, after several months' artificial cultivation, lost its power to produce hemolysis. This further is in favor of the hemolytic bacilli being called influenza bacilli.—*Authors' abstract.*

60. The Microbial Symbionts of the Tongue and Alveoli in Health and in Pyorrhea Alveolaris.
Albert Schneider.

The mouth organisms may be divided into the following groups: (1) Normal to the mouth; (2) pathogens peculiar to the mouth, teeth and alveoli; (3) incidental systemic pathogens; (4) food digesters. The dorsum of the tongue harbors mouth microorganisms and from it distribution of mouth organisms proceeds. The difference in the microbial fauna and flora of the mouth in health and in pyorrhea is quantitative rather than qualitative. The symbiotic relationships of the various mouth organisms require further study.—*Author's abstract.*

61. Types of Pneumococci—A Statistical Study. Chas. B. Morrey and Vera McCoy Masters.

A study from the files of the J. Am. M. Ass., for 1917–19 of pneumonia cases "typed" in the various Camp Hospitals.

TOTAL PNEUMONIAS	TOTAL PNEUMOCOCCUS	PER CENT				
		I	II	IIa	III	IV
6310	3736	59.2	10.2	13.3	4.1	30.3

Percentage of all pneumococcus pneumonias due to Types I, II, IIa, III..... 46.6
Percentage of all pneumococcus pneumonias due to Type IV................ 51.2
Type IV is thus shown to have caused more pneumonia than I, II, IIa, and III combined.
Percentage of all pneumonias due to Types I, II, IIa, and III, 27.6.—*Authors' abstract.*

62. Virulent Micrococcus catarrhalis Widely Disseminated in Throats during an Outbreak of Influenza. P. F. Clark and E. J. Murphy.

During an examination of the naso-pharyngeal flora of cases and contacts of influenza during the January, 1920, outbreak at the University of Wisconsin, a striking difference was observed as compared with similar findings during the more serious epidemics of 1918–19. The same general methods and media were in use in both instances, swabbings being made at the bedside with curved metal applicators and plantings made immediately on chocolate agar made from a beef infusion base adjusted to an H-ion concentration of pH 7.5.

The essential difference was that whereas in 1918–19 the throats contained a large number of hemolytic streptococci and virulent pneumococci, in the 1920 epidemic these organisms were noticeable by their absence, and instead the throats of the patients quite uniformly contained large numbers of a Gram-negative diplococcus.

This organism grew on ordinary media almost as well as on blood agar and produced a translucent, non-pigmented, somewhat raised, moist colony. On the various sugar media, it grew without producing any change in reaction determinable by litmus solution. It consequently corresponds closely to the four cultural descriptions of *M. catarrhalis*.

When injected intravenously into rabbits in amounts of 1 to 2 slant cultures per animal, the organisms produced a profound toxemia. The animals became prostrated within 12 hours after the injection, showing a rapid labored respiration, slight diarrhea and rise in temperature. Death occurred in from 48 to 72 hours. No lesions save cloudy swellings and occasional subserous hemorrhages in the intestines were observed at autopsy, but most striking was the fact that in no instance were the organisms recovered from the heart's blood or other organs of the body.

Agglutination tests with this organism and serum from convalescents proved to be negative, as were also similar tests made with Pfeiffer's bacillus. Obviously no etiologic relationship is suggested between the organism here described and the epidemic influenza. During the 1920 epidemic, however, this organism, *M. catarrhalis*, usually possessing little or no virulence, was rendered distinctly toxic for rabbits presumably by its association with the disease in question. This epidemic, as has been suggested by others, was less serious because of the absence of the more virulent streptococci and pneumococci which were so abundant in the 1918–19 epidemic.—*Authors' abstract.*

63. *The Alkali Producing Organisms in Scarlet Fever.* R. W. Pryer.

An organism is described which thus far has been found only in scarlet fever cases. It is coccal in shape and is characterised by a very resistant spore and the production of alkali in carbohydrate media. The best media for isolation contain 1 per cent peptone, 10 per cent sucrose, 1.5 per cent agar, and 50 cc. normal sodium hydrate per liter. We have isolated this organism in 8 out of 40 cases of scarlet fever while in 50 control cases the organism was not found. The organism is pathogenic for guinea pigs and white mice. Its pathogenicity is soon lost. Agglutination with serum from convalescent scarlet fever cases was interfered with by spontaneous agglutination in the method used. The organism may be an yeast, although no budding forms have been seen. It is probably not a true bacterium.

Other alkali producing organisms have been isolated but are not agglutinated by specific sera prepared from the alkali producing, spore bearing coccus form.—*Author's abstract.*

64. *Case of Meningitis in Infant Due to a Thread-like Organism.* M. W. Lyon, Jr., and Milo K. Miller.

An apparently new species of microorganism, *Bacillus trichodiphtheroides*, has been isolated from a case of purulent meningitis in an infant previously suffering with bronchopneumonia. It appeared as a small bacillus in the spinal fluid, grew into thread-like forms on first culturing, later becoming bacillary with Gram-positive polar bodies and segments. It was not pathogenic for rabbits or cavies.—*Authors' abstract.*

SCIENTIFIC PROCEEDINGS OF THE LANSING BRANCH SOCIETY OF AMERICAN BACTERIOLOGISTS

October, 1920

65. *Metallic Flavor in Dairy Products with Special Reference to Butter.* G. L. A. Ruehle.

Experiments were conducted in which iron lactate and copper lactate at the rate of 200 parts per thousand were added to cream that was made into experimental butters. The latter were studied both when fresh and after a period of cold storage. It was found that both salts were capable of producing the flavor in fresh butter. In storage butter the metallic flavor was followed by tallowiness and fishy flavor in the case of the addition of copper lactate and of indefinite off flavors in the case of iron lactate.

Two bacteria of the *B. subtilis* group, one isolated from metallic flavored butter and the other from a sample of bitter milk, when inoculated into the cream which was then made into butter, produced the flavor very faintly when the butter was fresh but after varying periods of storage produced the flavor to a notable degree.

Other members of the *B. subtilis* group when inoculated into fresh milk, produced the flavor in 24 to 72 hours when the milk was held in an ice-box. The rapidity of development of the flavor seemed to be correlated with the ability of the microorganisms to produce peptonization of litmus milk when held at 37°C. The members of the *B. subtilis* group which were found to produce metallic flavor were: (1) *B. mycoides;* (2) *B. megatherium;* (3) *B. vulgatus* (*mesentericus vulgatus*); (4) *B. ramosus;* (5) *B. subtilis* (laboratory strain); and (6) *B. subtilis* (American Museum of Natural History strain). A control tube was not metallic, but the addition of Difco "peptone" resulted in a flavor very similar to metallic.

Further experiments are in progress and will be reported fully later.—*Author's abstract.*

66. *Titration of Culture Media.* Frederick W. Fabian and G. L. A. Ruehle.

Three methods were compared: (A) the standard procedure, 5 cc. media + 45 cc. water and + boiling to get rid of CO_2 and titrating while hot; (B) same as procedure A except titrated when cold; and (C) neutralizing CO_2 in 45 cc. of water by titrating with an alkali then adding media and titrating cold. All titrations were done at the same time with same media using carbonate free N/20 NaOH. Eight samples of water from different sources were used to titrate the 12 different media differing widely in reaction. pH values were determined for all samples of water and media used. A chemical analysis was made of all samples of water. The results secured by method A were variable while methods B and C showed but slight variation. Due to the ease and rapidity of method C, it is the method recommended. —*Authors' abstract.*

November, 1920

67. *The Rate of Absorption of Anti-Sheep Hemolysin by Sheep Cells.* R. L. Kahn and D. S. Lyon.

A study was undertaken to determine the rate of absorption of amboceptor by sheep cells in order to throw light on a method for the removal of natural amboceptor from the patient's serum employed in this laboratory. The unit of amboceptor was taken to be the smallest quantity which hemolyzed 0.1 cc. of a 5 per cent suspension of packed sheep cells in the presence of 0.1 cc. of 1–10 pooled guinea pig complement after 15 minutes' incubation in the water bath ($\frac{1}{10}$ quantities of classical Wassermann). Preliminary experiments carried out with 20, 50 and 100 units of amboceptor established that 0.05 cc. of packed sheep cells will absorb these amboceptor quantities after 5 minutes' extraction at room temperature. A study was then made of the number of amboceptor units absorbed by 1 drop (approximately 0.05 cc.) of packed sheep cells when added to a saline solution containing 400 units of amboceptor and extracted for 5, 10, 15 and 20 minute periods at room, water bath and ice box temperatures. It was found that the sheep cells absorbed more amboceptor in the water bath than at room temperature, and least amboceptor at ice box temperature. About 80 per cent of amboceptor was absorbed in all cases during the first 5-minute extraction period. When amboceptor-serum was added to pooled human serum and extraction carried out with sheep cells, the number of units of amboceptor absorbed was greater than the number absorbed from saline solutions. The tests were repeated with corpuscles of 5 different sheep. The results indicate that a drop of centrifugalized cells added to 1 cc. of serum and permitted to extract for 10 minutes at room temperature, is sufficient for the removal of natural amboceptor from human serum in the Wassermann test.—*Authors' abstract.*

DECEMBER, 1920

68. *The Effect of Inactivation on the Antibody Content of Syphilitic Sera.* R. L. KAHN AND A. G. BOYD.

Wassermann tests were performed with raw and inactivated (½ hour at 56°C.) sera with a view to determining the number of so-called syphilitic antibodies destroyed during inactivation. Two antigens were employed, an alcoholic extract antigen of beef heart and a cholesterinized antigen of pig heart. Each serum was employed in dilutions of 0.01 cc., 0.007 cc., 0.004 cc., 0.003 cc., 0.002 cc., 0.001 cc., 0.0005 cc., and 0.0003 cc. to help determine differences in antibody content.

It was found that in the case of strong positive sera the difference in antibody content before and after inactivation was quite small, amounting to about 5 per cent. In the case of weak positives, however, the difference in antibody content was considerable and depended largely on the mode of fixation. When water bath fixation (½ hour) was resorted to, the loss of antibodies due to inactivation was in some cases as high as 50 per cent. However, when the fixation was carried out for 4 hours in the ice box the sera tested were found to be stronger rather than weaker after inactivation. This apparent increase in antibody content in the case of weak sera frequently amounted to 50 or 100 per cent. It appears that while the inactivation of serum for ½ hour at 56°C. may lower the antibody content when water bath fixation is resorted to, it has a tendency of apparently increasing the antibody content when ice box fixation is employed.—*Authors' abstract.*

SCIENTIFIC PROCEEDINGS OF THE LABORATORY SECTION, AMERICAN PUBLIC HEALTH ASSOCIATION

FORTY-NINTH ANNUAL MEETING, SEPTEMBER 13–17, 1920, SAN FRANCISCO, CALIFORNIA

69. *A Classification of Diphtheria Bacilli Based on the Toluidin Blue-Iodine Method of Staining.* HENRY ALBERT.

Diphtheria bacilli vary considerably in size, shape and internal structure. By the staining methods heretofore employed, it has not been possible to definitely distinguish between virulent diphtheria bacilli and those which are not capable of producing disease.

A new method of staining diphtheria bacilli, first described by the author a year ago, causes the internal structure of diphtheria bacilli to stand out rather prominently. It shows that certain forms heretofore regarded as solid are in reality barred or granular forms. It enables diphtheria bacilli to be classified into 8 types according to their size, shape and internal structure. Primarily they are divided into the 2 classes of granular and barred. Each of these is divided into 4 subdivisions—namely, short, medium, long and club-shaped. The method of staining is also of considerable value in distinguishing between virulent and non-virulent forms of diphtheria bacilli, since no culture capable of producing disease was found which did not contain granular types of the bacillus. This does not hold true for specimens strained by other methods.—*Author's abstract.*

70. *The Urgent Need for the Standardization of Laboratory Work.* ARTHUR LEDERER.

The call for standardization of laboratory work has been voiced in the past. The American Public Health Association deserves credit for having made a successful beginning several years ago in the standardization of laboratory procedures pertaining to water, sewage, milk, etc. At that time these called for the most important consideration from the public health standpoint as the most potent medium of infection. Our conception of what constitutes public health has in late years become more broadened. The question arises as to how far we shall go in our attempts to standardize laboratory procedures. While it is difficult to draw a distinct line it should be recognized that the bacteriological and serological procedures of a public health aspect should be standardized first. This includes the Wassermann and allied complement fixation tests, also the identification of the meningococcus, and the miscellaneous streptococci and the isolation of the intestinal pathogenic organisms from the excreta. Other tests may be added as the work of standardization proceeds and as necessity may indicate. No one should underestimate the difficulty of attempting to standardize the Wassermann test.—*Author's abstract.*

71. *Review of our Knowledge of Bacterium tularense.* C. W. CHAPIN.

This disease was first observed among the California ground squirrels about 10 years ago. Natural infection has been observed in ground squirrels and rabbits, among the lower animals. In man the disease appears as an ulcerative conjunctivitis or in the form of an infection of the lymphatic glands, known as "Deer-Fly Fever." The lesions in animals are not to be distinguished from those of plague, but the organism bears no resemblance whatever to the plague bacillus, morphologically or culturally. The outstanding cultural peculiarity is the strict limitation of growth to media containing egg yolk. The organism refuses to grow on any other medium. The serological relationships are discussed and the lesions, morphological and cultural requirements are given in some detail.—*Author's abstract.*

72. *Standardization of Botulinus Antitoxin.* I. A. BENGTSON.

A method has been established for the standardizing and testing of botulism antitoxin which is similar to that employed for the testing of tetanus antitoxins. Standard serums for both the Types A and B are used as the basis of measurement for determining the potency of antitoxins of unknown value.

In establishing the unit, the antitoxins to be used for standards were measured against 100 minimal lethal doses of dried toxins of the corresponding type and the smallest amount which just failed to neutralize the dose of toxin was determined. This amount was considered to contain one-tenth of the unit. The unit, therefore, just fails to neutralize 1000 minimal lethal doses of the toxins originally used.

The standard antitoxins are to be used as the basis for comparing the neutralizing power of unknown antitoxins. The smallest amount of the toxin in use which just fails to neutralize one-tenth the antitoxin unit must first be determined. This is necessary, since not all toxins have the same combining power. The test dose having been established by the use of the standard antitoxin, the number of units in the unknown antitoxin may then be determined by titrating against the test dose of toxin.—*Author's abstract.*

73. The Testing of Antistreptococcic Serum. Ella M. A. Enlows.

The difficulties involved in the standardization of antistreptococcic serum are unusually great. From the systematic standpoint there is no line of approach to the solution of this problem that does not necessitate the use of insufficiently defined species. The reason for this lies perhaps in the lack of coordination of the schemes of classification presented by the different investigators. Undoubtedly the final word will be said by the worker who presents a scheme based upon a combination of morphology with physical and chemical activities *in vivo* and *in vitro*.

The second difficulty involved is that of the uncertainty as to the etiological connection of any particular species or group of streptococci with a particular pathological process, since they are so often secondary invaders. Also, the rôle played by type specificity is undetermined. The agglutination method so well adapted to determine such questions is not a very great success here, since so many strains of the hemolytic streptococci exhibit spontaneous clumping and show nonspecific agglutination. The work of Dochez, Avery and Lancefield combining the agglutination method with the mouse protection test has resulted in the determination of four rather definite types which they have designated as S 3, S 23, S 60 and S 84. These types have been used in our efforts to secure a method for testing the commercial antistreptococcic serums. The earlier work was done with strains of hemolytic streptococci isolated from different pathological conditions. Rabbits were immunized with these strains and their serum tested against the particular strain used as antigen and also against several others, both by the agglutination method and the protection test. The results showed that as a rule the serum contained antibodies only for the antigen used in its production. Since the substitution of the four types of Dochez, Avery and Lancefield for the strains formerly used, a polyvalent horse serum has been secured which gives protection rather uniformly when injected into white mice from 18 to 24 hours prior to their inoculation with definite doses of virulent hemolytic streptococci representing these four types.—*Author's abstract.*

74. Special Applications of Chemical Data to Water Supply Investigations. W. M. Cobleigh.

The diagnostic significance of chemical data obtained in routine water supply investigations is sometimes difficult to determine. However, in some cases the proper selection of chemical tests may give specific information of special value. Three water supply investigations made by the Montana State Board of Health, are reported where chemical tests were effectively applied.

The pumping plant of the Gardiner water works is located so that water can be drawn either from the Yellowstone River or the Gardiner River. The former is the safer source of supply and its exclusive use has been ordered. The Gardiner River is contaminated with sewage.

The chemical characteristics of the waters from these two rivers are strikingly different in several particulars. Hence comparative sanitary and mineral examinations of a series of water samples show definitely just which source of supply is in use at any given time. Such data give either an indication of defects in the intake pipe line or the faulty operation of the plant.

A deep well at Logan, drilled in a limestone formation was believed to be the source of typhoid infection. A sanitary analysis indicated plainly the presence of contamination, and a cesspool 200 feet distant was apparently the source.

A solution containing 100 pounds of common salt was introduced into the cesspool. Within twenty-four hours the chlorine content of the well increased from 2.8 parts per million to 23 parts and the chlorine content of another well, believed from the field data to be beyond the zone of contamination by the cesspool, was not changed. The investigation showed that the cesspool was contaminating the well and hence the cesspool was abandoned.

At Laurel a typhoid epidemic was caused by a sewage contaminated water supply under very unusual conditions. Through improper construction and operation, sewage polluted water was allowed to flow directly over the intake pipe line which delivered water from the Yellowstone River to the pumping plant. Through the chemical analysis of a series of water samples, it was demonstrated that the intake pipe line, laid in alkali soil, had been constructed with uncalked joints. The presence of alkali salts in the water delivered by the pumps, was the first indication that the joints were uncalked and were admitting ground water to the intake line. Later experiments demonstrated that the sewage contaminated water flowing along the surface of the ground over the pipe line could have been drawn into the intake line through the open joints of the pipe. The pipe line was dug up and a new one constructed.

These experiences are used as a basis for suggesting that chemical tests be given an important place in certain water supply investigations, especially in cases where unusual conditions prevail.—*Author's abstract.*

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ABSTRACTS
OF
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UNDER THE EDITORIAL DIRECTION OF THE
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FEBRUARY, 1921

EDITOR
A. PARKER HITCHENS

It is characteristic of Science and Progress that they continually open new fields to our vision.—PASTEUR

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ABSTRACTS OF BACTERIOLOGICAL LITERATURE

CHARACTERIZATION AND CLASSIFICATION

(See also Number 281)

75. *Report of Committee on Descriptive Chart. Part II. Report of Progress during 1919.* H. J. Conn, Chairman; H. A. Harding, I. J. Kligler, W. D. Frost, M. J. Prucha and K. N. Atkins. J. Bact., Balt., 1920, **5**, 315–319.

The report is taken up largely with a discussion of the descriptive chart for the characterization of bacteria. The folder *versus* the two-page chart is discussed and instructors are asked to write to the chairman of the Committee, Dr. H. J. Conn (Geneva, N. Y.) to express their preference in this matter. The "group number" is under revision and will be reported on later. The Committee plans to leave space on the revised folder for the recording of pathogenicity under a title which will leave the space available for habitat relationships of the saprophytes as well. The Committee is publishing the pamphlet containing a "glossary" and the description of technic and methods. Special investigations on methods are being continued.—I. S. F.

NEW SPECIES

76. *Biological Studies on Intracellular Bacteria. No. 1.* R. W. Glaser. Biol. Bull., Bost., 1920, **39**, 132–145.

A summary is given of the present knowledge of the organisms which infect certain blattids, homoptera and ants, which are transmitted from generation to generation through the egg. These organisms are always present in their host and live in certain differentiated cells called bacteriocytes. In some species of insects one organism only is known to live as a symbiont but in other species two or even three symbionts have been noted. Two species of spirilla isolated from *Parcoblatta virginica* and *Periplaneta americana* were isolated and studied. Specific names are not given to these. They are alike in most characteristics. Both grow readily upon nutrient agar as rods, some curved, others straight, 1.5μ to 2μ in length; they stain readily, are Gram-negative, do not produce endospores and are motile by means of a single polar flagellum. They liquefy gelatin. With one organism litmus milk is not changed except that reduction is complete in 8 days but with the other there is prompt coagulation with reduction, but no acid. With one, growth is abundant on potato, with the other quite scanty. Indol is negative, ammonia positive, nitrates are not reduced to nitrites and diastase is positive.

A discussion is given concerning the biochemical activities of these intracellular organisms studied. It is concluded that these organisms are probably the result of true parasitism in their ancestors. The author says: "During an early period the organisms now found as harmless entities within the insects, were parasites producing pathogenic conditions and disease. It seems to me, that such structures as the mycetocytes, bacteriocytes and mycetomes are a survival of previous pathologic changes. Later acquired immunity principles became heritable and the toxins and other effects came under control. The insects could not fully rid themselves of the invaders on account of the fact that transmission from generation to generation has established itself with unerring precision. Still later, the microorganisms lost all of their harmful effects and since they secreted a number of enzymes that proved serviceable to the hosts, the latter were not exterminated, but were probably diverted from their normal phylogenetic course."—R. E. B.

77. *A Highly Resistant Thermophilic Organism.* P. J. Donk. J. Bact., Balt., 1920, **5**, 373–374.

Spoiled corn which had been processed at 118° for 75 minutes showed the presence of a thermophile which has since been found in cans of spoiled string beans and of corn on the cob. The name *Bacillus stearothermophilus* (N.S.) is proposed for the organism. The organism is a large rod with rounded ends, 0.8 by 3.5 micra, growing in two's and in short chains; is aerobic, facultative anaerobe; polar endospores present; non-motile; Gram-negative; grows on ordinary media at 60° to 65°C., with an optimum at 50°C., maximum 76°C. and minimum at 45°C.; does not liquefy gelatin; produces acid but no gas from glucose, lactose and sucrose, and acid from starch; does not grow on potatoes; produces acid in milk, no coagulation of the casein in 48 hours, with reduction of the litmus and digestion of the casein after 4 days; does not produce indol and does not reduce nitrate.—I. S. F.

78. *Een belangrijke Bacil als Oorzaak van Septico-Pyaemie bij het Veulen. (An Important Bacillus as Cause of Septico-pyemia in the Colt.)* L. de Blieck and E. A. R. F. Baudet. Tijdschr. v. Diergeneesk., Utrecht, 1919, **46**, 487–491.

This organism was described by de Blieck in 1906 and mentioned since that time by Van Straaten, (1911) and by Adersen (1916). The authors found it again in 1918 in an apparently healthy colt which was used as a test animal for the study of infectious anemia. It was found in multiple embolic abscesses of the kidneys. The bacillus has a length of 1 to 3 microns, a width of 0.5 micron and is somewhat polymorphous, most resembling *B. pyogenes bovis*. In the pus the bacilli are often gathered in groups, have rounded ends, are of unequal size and do not stain according to Gram. It is not motile. Most conspicuous is the growth on agar; very small and closely adhering colonies. They are somewhat larger on serum agar but equally adherent. In certain generations, there are larger colonies, less attached and also mucoid, but they are apt to revert to the original type during subsequent transplantation.

The condensation fluid scarcely becomes turbid and shows separate colonies like fine grains of sand. Later on the fluid becomes cloudy and ropy.

Surface colonies on agar have smooth edges and present little that is characteristic. Deep agar colonies resemble somewhat very recent ones in gelatin, but present no cauliflower-like forms, remain more rounded with lobate contours.

The form of the colony on gelatin has microscopically a very characteristic aspect. The margin is smooth, but the marginal zone has a radiating structure, while the interior is wavy in construction. Seen in reflected light, the colony has a cauliflower-like appearance. Growth on gelatin is very slow and the medium is not liquefied. In gelatin stabs it grows along the entire needle track. The margin of the growth is lobulated. Bouillon shows a luxuriant growth after 18 hours, with a marked, slimy deposit and a slight cloudiness of the liquid.

There is but little growth in peptone-salt solution which is no different after the addition of lactose or glucose.

Milk coagulates after 24 hours and becomes acid. In 48 hours it becomes slimy. Sometimes coagulation only occurs after 5 days.

The sugars are not split and no indol formation takes place. The growth on potato is slight with white, ropy colonies. Solidified blood serum yields small, adhering colonies. Neutral-red agar begins to discolor after 18 hours, but apparently this is not a constant feature.

In Petruschky's litmus whey the growth is slight only on the bottom around the inoculum. The medium becomes less red and more violet.

The cultivation of the bacillus is difficult and pathogenicity to small laboratory animals not very marked and inconstant.

In the horse the injection caused a marked local reaction, terminating in a large abscess.

The authors propose the name *B. pyo-septicus equi*.—L. V. E.

79. *De nomenclatuur van Bacillus pyosepticus equi.* (*The Nomenclature of Bacillus pyosepticus equi.*) L. DE BLIECK. Tijdschr. v. Diergeneesk., Utrecht, 1920, 47, 113–114.

The author refers to an article by Magnusson in which the latter describes 236 cases of joint-ill in colts from which he isolated in 30.9 per cent a bacillus which he named *Bacterium viscosum equi*. The author also calls attention to a description of similar cases by McFadyean in which the same organism was found, considered to be identical with the one described by Theiler and Mayer as *Bacillus nephritidis equi*. The author regards these organisms as probably identical with *Bacillus pyosepticus equi* so named by him and the *Bacillus equirulis* of Van Straaten.

If these organisms are all identical the name *Bacillus nephritidis equi* should be given preference according to the law of priority.—L. V. E.

BACTERIAL NUTRITION AND METABOLISM

80. *Inhibitory Action of Paratyphoid Bacilli on the Fermentation of Lactose by Bacillus coli I.* THEOBALD SMITH AND DOROTHEA E. SMITH. J. Gen. Physiol., 1920, 3, 21–33.

The authors succeeded in dividing the bacteria belonging to the intermediate or paratyphoid group of organisms into two classes. The technic used is to inoculate the organism in question into lactose broth for 4 days then making a second inoculation with certain types of *Bacterium coli*. The *Bacterium coli* will be found to produce the usual amount of gas in the presence of organisms belonging to the true hog-cholera sub-group but not in the presence of the true paratyphoid and enteriditis type. In both cases the production of acid proceeds. The two most probable explanations, namely the direct association of the inhibition with living paratyphoid bacilli or the existence of a ferment or other product of growth as the inhibiting agent, were investigated. The former apparently is indicated as the result of the studies. The inhibiting factor was destroyed by sterilization at 100°C. or above but was not completely destroyed at 62°C. for 35 minutes. Variations in the amounts of lactose did not interfere with the development of this factor determining inhibition. As a tentative hypothesis, the writers suggest that the inhibitory agent is some metabolic product of the paratyphoid bacillus, "probably an enzyme which is destroyed at a temperature somewhat above the thermal death point of the bacilli and which more gradually disappears from incubated cultures. The substance fails to pass Berkefeld filters. It is carried down mechanically with substances clearing the culture fluid. The experiments support current theories which hold that the acid-producing and gas-producing entities in cultures are distinct."—R. E. B.

81. *Comparative Studies on Respiration. XIII. An Apparatus for Measuring the Production of Minute Quantities of Carbon Dioxide by Organisms.* MARIAN IRWIN. J. Gen. Physiol., 1920, **3**, 203–206.

The author describes an apparatus for the measurement of small quantities of carbon dioxide produced by organisms at relatively short intervals. It is a modification of that of Osterhout, in which air is caused to circulate through a tube containing the organisms to be studied and then into a tube containing a suitable indicator. The amount of carbon dioxide evolved is judged by the color changes in this indicator when compared with buffer solution containing the same amount of indicator.—R. E. B.

82. *A Correlation Study of the Colon-Aerogenes Group of Bacteria, with Special Reference to the Organism Occurring in the Soil.* CHEN CHONG CHEN AND LEO F. RETTGER. J. Bact. Balt., 1920, **5**, 253–298.

During a period of 2 years some 317 soil samples were collected with a very careful technic and 467 strains of colon-aerogenes organisms were obtained for careful study. Of this number, 447 were finally identified as belonging to the aerogenes-cloacae sub-group and 20 as typical *B. coli*. In addition comparative studies were made on 173 coli-like organisms isolated from human and animal feces (23 samples). All of these strains from feces proved to be typical *B. coli*. That no aerogenes types were isolated was taken to indicate that their occurrence in feces is uncommon. All isolations were made by direct plating on plain agar at 30°C. for 48 hours, and by testing in lactose fermentation tubes of all coli-like colonies. Studies of motility gave no sharp distinction between aerogenes and coli types. With few exceptions all the strains turned milk red and coagulated the casein within 72 hours. Gelatin cultures at 20°C. were all negative for liquefaction. At 37°C. of 467 cultures 17 gave positive liquefaction. Tests for indol were made by the Salkowski and by the Ehrlich methods. The latter was found to be more delicate and more reliable, and is recommended for accurate work. All of the fecal strains (173) were indol positive by the Ehrlich test. Of the aerogenes types from soil less than ⅓ were indol positive. The *B. coli* types from soil were 15 indol positive and 5 negative.

In the studies on acid production, 30°C. for 3 and 5 days was used for the di-potassium phosphate-glucose-peptone medium (using Witte and Difco peptones) and for the synthetic medium (asparagine) of Clark and Lubs. After 3 days' incubation nearly all of the aerogenes cultures were still methyl red positive. After 5 days' incubation all of the aerogenes strains were methyl red negative (excepting 26 with the Difco peptone). The soil cultures of the coli type are uniformly methyl red positive after either 3 or 5 days' incubation at 30°C. and the fecal coli strains are all methyl red positive after 5 days. With coli cultures the final hydrogen ion concentration may be read after 3 days' incubation, but with aerogenes the final or limiting hydrogen ion concentration is masked by the simultaneous production of alkali. While the pH+ is changing from the acidic to the alkaline value in cultures of aerogenes strains there is no appreciable increase in the ammonia content of the medium. The authors are therefore inclined to give credence to the views of Ayers and Rupp although recognizing that changes in ammonia content may partially explain the increasing alkalinity of aerogenes cultures after the 3d day of incubation. With the aerogenes types sugar is uniformly absent or present only in traces after the 10th day of incubation; with coli types it is still uniformly present, indicating that with the latter the limiting hydrogen ion concentration is reached before the sugar has been completely utilized. With the Durham fermentation tube and the Frost gasometer the aerogenes strains gave larger gas production than the coli strains. From a few gas analyses (cultures *in vacuo*) the soil aerogenes type gave a 2.16 ratio for CO_2/H_2 and a fecal coli type gave a corresponding ratio of 1.06.

In these studies the technic of the Voges and Proskauer reaction was modified. As finally used 1, 3 and 5 day cultures were used; 5 to 6 cc. of the culture fluid were well shaken in a test tube with an equal volume of 10 per cent KOH and incubated at 30°C. The tubes were again thoroughly shaken after 1 to 3 hours. By this method the V and P reaction could be accurately observed within 2 or 3 hours. A total of 3725 V and P tests were made. All aerogenes strains were V and P positive; all coli strains (from soil and from feces) were negative. Positive V and P tests may be obtained with cultures only 10–14 hours old. With mixed cultures (aerogenes and coli) the methyl red test reveals the presence of the coli and the V and P test the presence of the aerogenes.

All aerogenes strains were found to grow in the uric acid medium of Koser; all fecal coli types failed to grow in this medium. Of the 20 coli strains from soil, 10 were and 10 were not able to utilize uric acid. With xanthine instead of uric acid as a source of nitrogen all coli types failed to grow, and all aerogenes types grew. Theobromine and caffeine failed to give sharp results.

All of the strains fermented glucose and lactose. Sucrose was attacked by both coli and aerogenes. Fecal and non-fecal types could not be distinguished by fermentation of adonitol.

By repeated re-plating the number of "atypical" strains were reduced from 18 to 4. These 4 with doubtful methyl red tests were V and P positive and attacked the purin ring (aerogenes types by these tests).

Excepting for the 20 soil coli strains and the 4 "atypicals" the methyl red positive organisms (coli) are uniformly V and P negative and purin negative and vice versa for the methyl red negative (aerogenes) strains. These studies lead the authors to the conclusion that the *B. coli* and the *B. aerogenes* types are distinct in their existence in nature and can accurately be set apart and distinguished. When carried out with care the Vosges and Proskauer test is considered as being even more satisfactory than the methyl red test, and the uric acid test as also of fundamental importance.—I. S. F.

83. *The Relative Effect of Phosphate-Acetate and of Phosphate-Phthalate Buffer Mixtures upon the Growth of Endothia parasitica on Malt Extract and Corn Meal Media.* M. R. MEACHAM, J. H. HOPFIELD AND S. F. ACREE. J. Bact., Balt., 1920, 5, 305–308.

Malt extract and corn meal extract, used in culture media, have been successfully buffered between pH = 1 and pH = 8 with phosphate-acetate and with phosphate-phthalate mixtures. With asparaginic and other amino acids the acidity can be regulated accurately between pH = 1 and pH = 13. (Details not given in this paper.) Phosphate-phthalate stimulates 25 per cent better growth than phosphate-acetate buffer in malt or corn meal extract media for culturing *Endothia parasitica.* With same buffers, malt extract serves as a better base than corn meal extract. The authors suggest that biologists should study the influence of non-ionized acids, bases and salts as well as the ion fractions.—I. S. F.

84. *A Method of Determining the Relative Toxicity of Sodium, Potassium, Lithium, and Other Ions toward Endothia parasitica: Data on Sodium Chloride.* M. R. MEACHAM, J. H. HOPFIELD AND S. F. ACREE. J. Bact., Balt., 5, 1920, 309–313.

Increasing concentrations of sodium chloride from 0 to 0.63 normal were added to a 2.5 per cent malt medium which had been buffered with M/50 K_2HPO_4 and M/50 acetic acid and which had been brought to a pH of about 5.0 by the addition of HCl. 1.5 per cent agar was added and the medium poured in plates. The radial growth of *E. parasitica* was measured after 15 days at 25°C. The growth decreases with increase of salt concentration. Sodium chloride is, however, only mildly toxic, a 3.65 per cent solution (0.63N) decreasing it to only 25 per cent of the normal. The shape of the growth curve is tentatively considered to indicate that the salt ions are more toxic than salt molecules.—I. S. F.

85. *Notes on the Fusiform Bacilli of Vincent's Angina.* S. R. GIFFORD. J. Bact., Balt., 1920, 5, 365–371.

A series of 24 examinations of organisms resembling the fusiform bacillus of Vincent's angina indicates that the variability to the Gram stain which has so frequently been reported in the literature is probably a real characteristic of the organism. In all smears Gram-positive granules were observed, in some Gram-negative bacilli. The variations are not the result of the method of staining. The organisms may be cultured anaerobically, or aerobically in the presence of aerobic organisms.—I. S. F.

86. *The Biology of Clostridium welchii.* J. RUSSELL ESTY. J. Bact., Balt., 1920, 5, 375–429.

Clostridium welchii (formerly known as *Bacillus aerogenes capsulatus*) was isolated by the use of "stormy fermentation" test of milk under anaerobic conditions. Subcultures were made in glucose liver broth and subsequently on glucose-liver-agar plates (anaerobic). Purity of cultures was determined by microscopic examination. Spores have been found in soil, dust on grains, in sewage, oysters, mud, etc. Vegetative forms have never been found except in the tissues of the animal body. A total of 626 cultures were isolated from raw and pasteurized milk and from human, cow, horse and guinea pig feces. *C. welchii* is non-motile; 3 to 6 micra long, 1 to 1.05 micra thick; ends slightly rounded or square cut; stains readily and is Gram-positive; capsules are present in cultures made directly from body fluids or body tissues, from milk or feces, but disappear in succeeding cultures. Spores are formed only in the absence of a fermentable substance but in a great variety of media. They never occur in the tissues, organs and body fluids of the living organism, but do occur in the intestine. The spores germinate readily in a great variety of media.

C. welchii is an obligate anaerobe and its growth in media is rapidly inhibited by the admission of free oxygen. The organism grows upon all ordinary culture media which contain peptone, and particularly well in 1 per cent glucose or maltose media. Spores survive indefinitely in the absence of fermentable substances. The optimum growth is obtained at 37°–38°C.; none below 10°C. or above 42°C. Freezing rapidly destroys both vegetative forms and spores. Gas (partly hydrogen) is produced abundantly on a variety of media. Colonies in plain and sugar agar are opaque white, grayish white or brownish in color. A dark center appears when the organism sporulates. Both gelatin and blood serum are liquefied, the latter with the production of a foul odor. The fermentation of milk ("stormy") is very characteristic, the casein is first coagulated and later digested with the production of a yellowish whey. All the mono-, di-, and poly-saccharides tested were fermented with the production of acid and gas. Mannitol and glycerol are never fermented. The organism is primarily fermentative and attacks proteins only sparingly in the presence of fermentable carbohydrates. Classification of strains is partially successful by the differences in action on inulin and glycerol.

Vegetative forms are killed by exposure for 15 minutes to temperatures between 56° and 63°C. Spores fall into two distinct groups with respect to thermal death points; one whose thermal death point is 87°–90°C., and the other above 100°C. Pasteurization kills all vegetative forms.

Different strains of *C. welchii* were found to show considerable differences in virulence for guinea pigs and for rabbits. The latter animals are more resistant to the organism. No infection could be produced with heated cultures containing spores, and no viable vegetative forms. The author confirms the results of Bull and Pritchard with respect to the production of a soluble toxin by *C. welchii*. Immunity can be produced by the injection of avirulent cultures or sublethal doses of virulent organisms. Feeding vegetative or spore forms has no ill effect.—I. S. F.

87. *Further Studies on the Growth Cycle of Azotobacter.* Dan H. Jones. J. Bact., Balt., 1920, **5**, 325–342.

From a series of studies on azotobacter cells over a period of years, the author inclines to accept certain of the views of Löhnis and Smith on the life cycles of the bacteria. He agrees that azotobacter has a complex life cycle; that following a period of reproduction by fission individual cells may develop reproductive granules (gonidia) within the cell plasma; and that after disintegration of the mother cell the dispersed granules may increase in size and become typical azotobacter cells which multiply by fission. The reproductive granules do not pass through a Berkefeld filter. Cells may contain another type of granule—non-reproductive and non-stainable. The author has observed a "symplastic" stage similar to that described by Löhnis and Smith, and in older cultures, thick-walled resting cells (arthrospores). The author fails to corroborate the claim of Löhnis and Smith that azotobaceter forms heat-resistant spores. Apparent heat resistance he considers a function of contaminating organisms. He has observed the appearance of true involution forms. Some of these appear to multiply to a very limited extent by a budding process. A series of 4 plates with 24 photomicrographs presents the various stages in the life cycle of azotobacter cultures.—I. S. F.

88. *A Note on the Viability of Meningococci on Yeast Agar Medium.* Frederick Eberson. J. Bact., Balt., 1920, **5**, 431–432.

Further observations on the viability of meningoococci in semi-solid yeast agar indicate that the organisms remain viable after 5 months' incubation at room temperature or at 37°C. No tests have been made of the virulence of surviving organisms, but experiments indicate that their antigenic nature—tested by the preparation of agglutinating sera—remains unchanged. For preparation of yeast agar, see Abstrs. Bact., 1919, **3**, 10.—I. S. F.

89. *The Use of Agar Slants in Detecting Fermentation.* H. J. Conn and G. J. Hucker. J. Bact., Balt., 1920, **5**, 433–435.

The use of agar slants in detecting fermentation (acid and gas production) has been tried out with a great variety of soil and milk organisms and found very successful. One per cent sugar is added, the medium adjusted to pH 6.8–7.2 and an indicator (or mixture of indicators such as Bronfenbrenner's) is added. Acid or alkali production are evidenced by color changes and gas production by the appearance of cracks or bubbles in the agar. Because the acids tends to be localized its presence can be detected after only a very few hours of incubation. The relation between fermentation and aerobiosis is easily observed. In the case of simultaneous acid and alkali production, the predominating acid production in first hours can be ascertained.—I. S. F.

90. *A Note on the Effect of Amino Acids on the Growth of Tubercle Bacilli.* Peter Masucci. J. Lab. & Clin. M., St. Louis, 1920, **6**, 96–98.

The development of *B. tuberculosis* was hastened by increasing the amount of amino acids in glycerin broth as these serve as the source of nitrogenous matter for building the bacterial protein. The amount of phosphorus was also increased by the addition of "aminoids" and this probably played a part in the greater growth of the organism since it is an important constituent of nucleo- and lecithin protein.—F. W. H.

91. *Ueber die Toxine und Antitoxine des Choleravibrio und anderer Vibrionen.* (*The Toxins and Antitoxins of the Cholera Vibrio and of Other Vibrios.*) R. Kraus. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1046–1048.

This is a contribution to the question of endo- and anti endo-toxins. In vibrio intoxications antitoxic serum is able to cure while a mere bacteriolytic serum is ineffective, even though it may dissolve the vibrios. Consequently cholera poisoning is a toxicosis due to the toxins of the vibrio. The antitoxin not only neutralizes the poison *in vitro*, but produces cure in suitable animals. It also is able in curative experiments to influence favorably the infection with living vibrios. This fact makes it necessary to assume that the same toxin is produced within the organism and is the pathogenetic agent. Bail's theory that the poisoning in cholera is due to anaphylatoxin is as yet without solid foundation.—B. C.

92. *Een neuwe Methode voor het kweeken van Miltvuurbacillen met Kapsel buiten het dierlijk lichaam.* (*A New Method for the Cultivation of Capsulated Anthrax Bacilli outside the Animal Body. Preliminary Communication.*) H. E. Reeser. Med. v. d. Rijksserum-inrichting, Rotterdam, 1917, **1**, 110–115.

After reviewing the literature pertaining to the formation of capsules in *B. anthracis*, the author describes his experiments undertaken in order to determine to what constituent of defibrinated blood, capsule formation could be ascribed. Three agar tubes inoculated with anthrax bacilli were covered with freshly defibrinated blood, 3 with inactivated defibrinated blood, 3 with fresh serum, 3 with inactivated serum, 3 with erythrocytes washed three times in physiologic salt solution and 3 with physiologic salt solution without blood as controls.

The finest capsules were obtained from the 3 agar tubes to which the fresh defibrinated blood had been added. In the preparations from the tubes with inactivated blood, with fresh and inactivated serum, capsules were present, but those showed degenerative changes. The margin of the capsule was not sharply defined and showed bulges which were especially plain between the bacilli. The bacilli within the capsules also had no normal aspect; they were mostly thiner, often linear; they were more difficult to stain and often presented the nodulated bamboo form. The control tubes with physiologic salt solution yielded preparations showing bacilli without capsules only and the same phenomenon was observed in the cultures covered with the washed blood corpuscles.

The author concludes that the bacilli are not sufficiently stimulated to form capsules by either the complement containing or the inactivated serum. For this appears to be necessary aside from the complement, also the erythrocytes, which *per se* are not capable of inducing the bacilli to form capsules. The experiment also showed that in order to induce capsule formation the blood must not be coagulated.—L. V. E.

PHYSICAL CHEMISTRY

(*See Number 87*)

BACTERIOLOGICAL TECHNIC

93. *Report of Committee on Descriptive Chart. Part III. A Modification of the Gram Stain.* KENNETH N. ATKINS. J. Bact., Balt., 1920, **5**, 321–324.

The following modified solutions and technic are recommended to replace two older and varied methods for making the Gram stain. The aniline sulphate solution and the iodine solutions are stable. Inasmuch as the alkaline iodine solution liberates free aniline from the aniline sulphate the staining is really by the method of Gram with a solution which is prepared as used. Aniline sulphate may be replaced by aniline oxalate. The results have been checked against those obtained with the better known solutions in use for the staining by Gram's method.

Staining solution

Saturated 95 per cent alcohol solution gentian violet	1 part
Aniline sulphate, 1 per cent aqueous solution	3 parts

Iodine solution

Iodine	2 grams
Normal solution sodium hydroxide	10 cc.
Water	90 cc.

(Dissolve the iodine in the sodium hydroxide solution and add the water.)

Decolorizing solution

Alcohol	95 per cent

Technic

The slide is prepared as usual and stained for one minute. Wash briefly to remove the excess of stain and apply iodine solution for one minute.

Wash thoroughly before decolorizing in alcohol for 2 minutes or until the alcohol is no longer colored. In thick smears, as pus, the decolorization may be continued for 10 minutes.

Wash. Counterstain. Wash, dry, mount.—I. S. F.

94. *The Filtration of Colloidal Substances Through Bacteria-Retaining Filters.* W. S. GOCHENOUR AND HUBERT BUNYEA. J. Bact., Balt., 1920, **5**, 363–364.

The authors had observed the superiority of fresh, sterile meat in media over heat-sterilized meat. The difficulty involved in addition of sterile meat cubes to previously sterilized media suggested the value of sterilization by filtration. The filtration of meat juice was found to be very slow, and was not improved by preliminary passage through cotton, asbestos wool and filter paper. Rapid filtration can be obtained by clearing the meat juice after it comes from the press by centrifugalizing; adding a small amount of kieselguhr; centrifugalizing; mixing the supernatant fluid with a second portion of kieselguhr; and pouring on a filter candle. The best results are obtained with a minimum filtration pressure.—I. S. F.

95. *A Simple Method of Isolating Bacteria from Pathologic Material.* H. C. KLIX. J. Lab. & Clin. M., St. Louis, 1920, **6**, 104.

The author describes a method of isolating bacteria in pure culture by the use of slants of solid media. Its advantages are its simplicity and its adaptability to any solid culture medium.—F. W. H.

96. *Een Practische Methode voor het Behouden van de Virulentie van Bacterien en voor het Verlengen van haar Levensduur in kunstmatige Voedings bodems.* (*A Practical Method for the Preservation of the Virulence of Bacteria and for the Prolongation of Their Period of Viability in Artificial Culture Media.*) E. A. R. F. Baudet. Tijdschr. v. Diergeneesk., Utrecht, 1920, **47**, 668–671.

Baudet confirmed the results obtained with a method described by Ungermann. (Arb. a. d. Haiserl. Gesundheitsamte. Bnd. 51. No. 1.)—L. V. E.

FERMENTATION INDUSTRIES

97. *Beiträge zur Geschichte der Essigfabrikation* (*Anleitung zu einem verbesserten Verfahren bei der Schnellessigbereitung von Martin Hofflmayr*). (*Contributions to the History of Vinegar Manufacture. Introduction to a Better Method of Quick Vinegar Manufacture, by Martin Hofflmayr.*) Wütenfeld. Deutsche Essigindust., 1920, **24**, 89–91.

A description with figures of the method of quick vinegar manufacture first described by Hofflmayr in 1833. The methods of preparing the raw materials and methods of improving quality are likewise discussed.—R. E. B.

98. *Beitäge zur Geschichte der Gärungsessigfabrikation.* (*Die Essigsieferei von Joh. Carl Leuchs*). (*Contributions to the History of Acetic Acid Manufacture. The Vinegar Industry, by Joh. Carl Leuchs.*) Wüstenfeld. Deutsche Essigindust., 1920, **24**, 153–155; 162–164.

A review of the text on vinegar manufacture by Leuchs published in 1829.—R. E. B.

99. *Beiträge zur Geschichte der Essiggärung* (*Die Geschwindessigfabrikation oder gründliche und praktische Anweisung nebst deutlicher Beschreibung und Zeichnung des hierzu erforderlichen Apparats, von C. E. Schneefuss*). (*Contributions to the History of Acetic Fermentation. Quick Vinegar Manufacture or Fundamental and Practical Introduction together with Definite Descriptions and Drawings of the Apparatus Required Therefor, by C. E. Schneefuss.*) Wüstenfeld. Deutsche Essigindust., 1920, **24**, 175–178.

A review of a book published by Schneefuss in 1820 discussing in detail the methods used at that time in the manufacture of vinegar.—R. E. B.

100. *Beiträge zur Geschichte der Essiggärung* (*Gründliche Unweisung zur Schnellessigfabrikation oder die Kunst in 2 Stunden einen guten, scharfen, chemisch reinen Essig ohne bedeutende Rosten . . . . usw. zu machen, von Aug. Lehmann*). (*Contributions to the History of the Manufacture of Vinegar Fermentation. Fundamental Introduction to the Quick Method of Vinegar Manufacture or How to Make a Good Sharp Chemically Pure Vinegar in the Course of Two Hours, by Aug. Lehmann.*) Wüstenfeld. Deutsche Essigindust., 1920, **24**, 184–186.

A review by Wüstenfeld of a book written by Aug. Lehmann in 1840 in which the methods of quick vinegar manufacture in use at that time are reviewed and discussed.—R. E. B.

101. *Verfahren zur Herstellung von milchzuckerhaltigem Milchessig.* (*Method for the Manufacture of Milk Vinegar from Milk Sugar.*) Deutsche Essigindust., 1920, **24**, 228–229.

Discussion of a French patent granted to Société F. Huberty et Cie. in Paris for the manufacture of milk vinegar from whey.—R. E. B.

MYCOLOGY

(*See also Number 232*)

102. *Über einen fall von Fadenpilzgeschwüren der Magenschleinhaut mit metastatischen Abszessen in der Leber.* (*A Case of Hyphomycete Ulcers of the Gastric Mucosa, with Metastatic Abscesses of the Liver.*) H. V. Meyenburg. Virchow's Arch. f. path. Anat. (etc.), Berl., 1920, **229**, 30.

The author considers the hyphomycetes as a secondary infection.—S. A. G.

SOIL BACTERIOLOGY

(*See also Number 82*)

103. *Studies in the Biochemical Decomposition of Cow-dung and Urine in Soil.* N. V. Joshi. Agr. J. India, 1920, **15**, 398–409.

Previous studies of the writer with green manures have indicated that nitrogenous matter in the soil does not give rise to an accumulation of nitrate, probably because of the excessive nitrate reduction in the presence of large amounts of carbonaceous matter. He has now tested this out further in the case of animal manures. Three types of manure were used in this work, cow feces, cow urine, and sheep-fold manure (containing feces and urine mixed). These were added to soil at the rate of 30 mgm. total nitrogen for 100 grams of soil, and nitrate determinations were made periodically. Urine, with the largest amount of nitrogen and the smallest amount of non-nitrogenous organic matter, showed the greatest nitrate accumulation; cow-dung, with the smallest amount of nitrogen and largest amount of non-nitrogenous material, showed no nitrate accumulation; while sheep-fold manure was intermediate. Urine is readily nitrifiable both fresh and stored, whether stored aerobically or anaerobically, but anaerobic storage is recommended as it loses nitrogen if exposed to the air. Cow-dung becomes nitrifiable upon storage either aerobic or anaerobic. The addition of straw to these manures in every case caused a decided decrease in the nitrate accumulation when added to soil.—H. J. C.

104. *Studies on the Root Nodule Organism of the Leguminous Plants.* N. V. Joshi. Mem. Dept. Agr. India, Bact. Ser., Calcutta, 1920, 1, 247–276.

Pointing out that there are still several points in dispute in regard to the nodule organism, the writer reports a series of experiments to investigate the following points: Specificity of different strains as tested by cross inoculation; benefit to the plant by the nodule organism growing in the soil without producing nodules; and possibility of isolating the organism directly from soil. In the cases tested the writer finds no evidence of cross inoculation, the plants of one legume remaining free from nodules when growing in soil inoculated with the organisms from a different kind of legume. Even in this case, however, some improvement in growth of the plant over uninoculated checks is to be observed, although not as much improvement as when the proper strain of bacteria is used for inoculation. The writer interprets this as meaning that the organism fixes nitrogen while growing freely in the soil and this nitrogen can be used by the plants from the soil, but that they are better able to use it when the organism is growing in nodules on their roots.

The writer has obtained further evidence to support this conclusion by growing oats in inoculated soil. A stimulation of growth results from the presence of the nodule organism, although of course no nodules are formed, about the same amount of stimulation occurring as when the soil in inoculated with *Azotobacter*. By inoculating the legume organism into soil in a porous pot and by growing either oats or legumes in an outside pot, further evidence of stimulation was observed under conditions that made invasion of the roots by the organisms impossible.

The writer definitely shows that the nodule organism can be isolated from soil and successfully used for inoculating legumes. Experiments are still being carried on to determine the best medium to use in isolation from soil.—H. J. C.

PLANT PATHOLOGY

(*See also Number 219*)

105. *Potato Wart.* G. R. Lyman, L. O. Kunkel and C. R. Orton. U. S. Dept. Agric., Circular 111, 1920.

The disease which was discovered in this country in 1918 presents another serious problem to the growers of potatoes. The distribution of the disease and means taken to prevent its spread in this country are discussed.—S. H. A.

106. *The Dry-Rot of Incense Cedar.* J. S. Boyce. U. S. Dept. Agric., Bull. 871, 1920.

Incense cedar is classed as an inferior species because of a uniformly heavy percentage of cull caused by the dry-rot fungus (*Polyporus amarus*). Judicious scaling and instruction in the proper methods of bucking will ultimately aid in changing this view. Dry-rot can be eliminated to a large extent from future stands by intensive fire protection, but it can not be entirely controlled in this way, owing to the continued occurrence of unavoidable mechanical injuries caused by pruning, lightning, and frost.—S. H. A.

107. *Diseases of Southern Pecans.* S. N. McMurran and J. B. Demaree. U. S. Dept. Agric., Farmers Bull. 1129, 1920.

The paper describes in a non-technical manner the diseases of southern pecans. Among those described which are due to specific organisms are scab, nursery blight, wood-rotting fungi, brown leaf-spot, crown-gall, anthracnose, powdery mildew, mistletoe, and dieback. Other diseases are mentioned which are due to unknown causes. Rosette, one of the most serious diseases, is due to the influence of environmental factors. Scab is the most serious of the diseases of pecans caused by fungi and it can be best controlled by the propagation of immune or highly resistant varieties. Spraying to control scab is essentially a preventive measure.—S. H. A.

108. *Control of the Root, Stalk, and Ear Rot Diseases of Corn.* James R. Holbert and George N. Hoffer. U. S. Dept. Agric., Farmers Bull., 1176, 1920.

The rot diseases of the roots, stalks, and ears of corn cause great losses, are widely distributed, have distinct characteristics, and require special control measures. The causes of the rot diseases have been shown to be due to certain fungi and bacteria commonly present in diseased corn plants in the field. One of the important discoveries in the investigation of corn rots is the fact that one of the fungi, *Gibberella sanbinetti*, is the same fungus that is most commonly the cause of wheat blight or scab. It develops on old corn stalks and is the most important source of scab infection when wheat follows diseased corn in the rotation. Various rot diseases are described, together with control measures.—S. H. A.

109. Transmission of the Mosaic Disease of Irish Potatoes. E. S. SCHULTZ AND DONALD FOLSOM. J. Agric. Research, Wash., 1920, **19**, 315–337.

The authors were able to transmit the disease by means of tubers, grafting, inoculation with plant juice and with aphids under various conditions, some of which were essentially those of the field.

Attempts to transfer the disease by means of flea beetles, Colorado potato beetle, seed-cutting knife and contact of vines, roots and seed pieces were unsuccessful. The disease does not appear to be transmitted through the soil. Diseased plants do not recover and it seems impossible to maintain disease-free stock if the disease exists in close proximity and insect carriers are present. If disease-free plants are protected from aphids either in cages or greenhouse they can be maintained disease free.—P. L. G.

110. Relative Susceptibility to Citrus-canker of Different Species and Hybrids of the Genus Citrus, Including the Wild Relatives. GEORGE L. PELTIER AND WILLIAM J. FREDERICH. J. Agric. Research, Wash., 1920, **29**, 339–362.

A continuation of work previously reported (J. Agric. Research, 1918, **14**, 337–357).

The successful inoculation of a large number of wild relatives in the greenhouse shows that *Pseudomonas citri* has a wide range of hosts and is not limited to the genus *Citrus*, though it is not believed that these results have any bearing on the eradication program.

All citrus plants tested have been successfully inoculated. All hybrids are attacked by citrus-canker in varying degrees. All false hybrids are extremely susceptible.—P. L. G.

111. Mosaic Disease of Corn. E. W. BRANDES. J. Agric. Research, Wash., 1920, **19**, 517–521.

A disease identical with the mosaic disease of sugar cane and other grasses previously reported by the writer is described. Golden bantam and probably other varieties apoear to be immune. The disease is readily transmitted by *Aphis maydis* and probably by other aphids as well.—P. L. G.

DAIRY BACTERIOLOGY

(*See also Numbers 202, 212, 220*)

112. Reaction of Milk in Relation to the Presence of Blood Cells and of Specific Bacterial Infections of the Udder. J. C. BAKER AND R. S. BREED. J. Biol. Chem., Balt., 1920, **43**, 221–235: N. Y. Agric. Exp. Station, Geneva, Tech. Bull. 80, 1920.

This paper develops the material previously published by one of these authors and Van Slyke (see Abs. No. 601, Vol. 4 of this Journal) along histological and physiological lines. The lowered H-ion concentration of certain freshly drawn milk is found to be correlated with the presence of increased numbers of leucocytes, streptococcic infections and an irregularly increasing amount of epithelial debris. While all of these things are in harmony with the view previously expressed that the lowered H-ion concentration of the milk containing streptococci was due to the entrance of unchanged blood serum into the milk, certain considerations lead the authors to modify this view. They conclude that a more exact statement of the case is that the bacterial infection causes the entrance of a serous exudate derived bv the gland cells directlv from the lymph, and that this serous exudate is neither exactly like blood serum nor lymph. They feel that it is probable that the increased CO_2 content of the milk samples having a lowered acidity is correlated with the entrance of bicarbonate from the blood. The H-ion concentration would also be lowered by the entrance of increased amounts of basic phosphates or even of albumens. While fibrin enters with this serous exudate there is no evidence of the entrance of glucose from the blood.—R. S. B.

113. The Effect of Pasteurization on the Number of Bacteria in Milk When This is Determined by Direct Microscopic Count. E. G. HASTINGS AND AUDREY DAVENPORT. J. Dairy Sci., Balt., 1920, **3**, 494–501.

This report from the Wisconsin Experiment Station is a critical study of the fate of the bacteria in milk killed during pasteurization as shown by a study of methylene blue staining of dried films of milk prepared by the Breed method. It is found that an irregular percentage of the organisms present in the milk appeared in stained and countable form after pasteurization, the percentage varying from 18 to 83 in the preparations made from the milk immediately after pasteurization. The percentage of stainable individuals frequently decreased in 6 to 24 hours after pasteurization so that some preparations showed only 3 per cent of the original number of bacteria. In other cases growth took place so that there were more bacteria after 24 hours than were present in the original milk.

In view of these findings, the authors are unable to confirm the claim made by Werner (see Abstract No. 950, Vol. 4 of this Journal) that it is possible to tell the number of bacteria present in milk before pasteurization by a microscopic examination of the pasteurized milk. The authors were also unable to confirm the findings of Kufferath and others that dead bacteria were present in unstained condition in the methylene blue preparations.—R. S. B.

114. Yeast in Pasteurized Cream Butter. T. H. Lund. Creamery & Milk Plant Monthly, 1920, **10**, 30.

An examination was made of 467 different samples of butter to determine the number, origin, methods of eliminating, and effect upon flavor of yeast in butter made from freshly pasteurized cream.

Large numbers were found but no definite relation could be established between the number and the flavor or keeping quality. The origin, according to the author, was due to a contamination with unclean utensils.—G. J. H.

115. Ulteriori ricerche sull'attività proteolitica dei fermenti lattici. III. L'influenza della sterilizzazione del latte. IV. La lattocoltura nella selezione dei fermenti latticoproteolitici. (Further Researches upon the Proteolytic Activities of the Lactic Bacteria. The Influence of Sterilization of the Milk. Milk Cultures and the Selection of the Lacto-Proteolytic Ferments.) C. Gorini. Rend. R. Accad. d. Lincei, **1917**, 26, 195–199; 223–227.

The author again calls attention to the fact that lactic bacteria do not limit their action to the fermentation of lactose, but also attack casein, thus acquiring importance in the ripening of cheese. This secondary action has too often been overlooked because of faulty technic on the two following points: (1) High temperature of incubation, optimum for the action being below 30°C.; (2) gelatin-liquefying properties being the only characters considered. The lactic organisms with a caseolytic property could not bring about gelatin liquefaction. In addition, the question of sterilization of the milk used for cultural purposes should be considered. If the sterilization has taken place at high temperatures and under pressure, or for a long time, the sterile milk acquires a brownish tinge which has often been ascribed to caramelization of the lactose, but which is accompanied and in fact preceded by an alteration of the casein. This alteration in the milk makes it unsuited for the demonstration of proteolytic or peptonizing functions of the bacteria inoculated therein. In addition the author has found that such brownish milk is of great value when the coagulating properties of the bacteria inoculated are considered. The lactic bacteria used by him in the study coagulate the casein by the contemporaneous production of acidity and enzyme action. Animal rennet is hindered in its action by a previous heating of the milk to a temperature above 40°C., a fact of great importance in cheese manufacture. By analogy the author explains the slower coagulation of the brownish milk to the unfitness of the medium. In such case coagulation should only take place by virtue of the first function of the cells—acid production. When this action is weak, as it is in many cases, coagulation is distinctly retarded. The slow peptonizing action of a bacterial species may be directly connected with its slow coagulating action, and this the author explains by the following theory. Animal rennet exhibits the above two functions in a state of equilibrium whereby casein is first coagulated and then peptonized, and the bacterial enzyme behaves likewise. Consequently its peptonizing function would behave towards the coagulated brownish milk casein in the same way as its coagulating function behaves towards the uncoagulated brownish milk. This interpretation of the phenomenon is accompanied by a criticism of the ordinary methods of sterilizing milk and by a recommendation as to the procedure of sterilization; i.e., intermittent sterilization and subsequent incubation for 15 days at 37°C. before use.—A. B.

116. Nuovo contributo ai silò lattici. (Contribution to the Subject of Lactic Silos.) C. Gorini. R. Istit. Lomb. d. Scienze e Lettere. Rendic. 1920, **53**, No. 11.

This is a recent contribution to the subject and a statement of criticism with regard to recommendations published by a Swiss company on the production of "sweet silage." The author points to the fact that a "sweet" product is not necessarily a satisfactory one. In addition to the usual routine measures taken in the preparation of silage a technical point of maximum importance is that of assuring the appropriate bacterial development. The lactic organisms which the author has studied, and recommends, are those capable of fermenting sugars other than lactose and of attacking the protein substances of the fodder, thereby rendering the nitrogenous compounds more assimilable. These lacto-proteolytic organisms overgrow other types and have been isolated by Gorini in nearly pure culture from silage of good quality prepared under farm conditions. Inoculation experiments on a small scale using natural and sterile fodder as a medium showed that the portions inoculated with the lacto-proteolytic organism produced greater acidity than the non-inoculated portions. A search for a butyric producer yielded positive results in the uninoculated portions while the portions inoculated with the lacto-proteolytic organism failed to show active development of the butyric flora.—A. B.

117. Is Ropy Milk Becoming a More Serious Dairy Trouble? H. A. Harding and M. J. Prucha. J. Dairy Sci., Balt., 1920, **3**, 502–521.

A supplementary report of the study of a long-continued epidemic of ropy milk that affected the product of a large milk distributor. The preliminary report has been already abstracted in this journal (Vol. 4, Abs. No. 1582). The organism concerned is identified as the common *Bacterium viscosum*, and a report is given of experiments to determine its thermal death point. It is concluded from these studies that proper pasteurization at 140–145° F. for 30 minutes should destroy this organism. The authors conclude that the widespread outbreak was due to a general distribution of the organism rather than to any unusual characteristics of the organisms concerned. They also feel that the changing methods of milk production and handling are making it relatively easy for outbreaks of this type to appear, while increased knowledge of the causal organisms is making it fairly easy to control such outbreaks.—R. S. B.

118. Bacillus Lactis viscosus Adametz als Oorzaak van slijmige Melk. (*B. lactis viscosus Adametz as a Cause of Ropy Milk.*) J. BOERSMA. Med. v. d. Rijksseruminrichting, Rotterdam, 1917, **1**, 103–109.

The connection between ropy milk and contaminated water used for cleansing purposes is clearly shown. The author further succeeded in showing the presence of the organism on the wheat straw used for bedding in the cow stables.—L. V. E.

119. Bitterness in Evaporated Milk. GEORGE SPITZER AND W. F. EPPLE. J. Dairy Sci., Balt., 1920, **3**, 486–493.

A report from the Indiana Experiment Station upon trouble experienced at a condensery from the spoilage of evaporated milk through the development of a bitter taste. The trouble appeared in a single batch of milk but did not affect all cans. Those cans having a bitter taste were found to contain large numbers of bacteria of a single species which is studied and described in detail. The following conclusions are reached:

"From the results of the bacteriological study the organism agrees morphologically and culturally with *Bacillus panis* Migula, described by Lawrence and Laubach.

"The thermal death point of this organism lies between eight to ten minutes' exposure to 250° F. under steam pressure.

"The substance secreted by this organism is proteolytically active, producing both peptones and amino acids. The results of the action on neutral, acid and basic substrate indicate the presence of more than one specific enzyme."—R. S. B.

COMPARATIVE PATHOLOGY

(*See also Numbers 78, 79, 159, 160, 166, 176, 184, 190, 206, 272, 302, 329*)

120. Foot-and-Mouth Disease: The Question of Invasion. STEWART STOCKMAN. J. Comp. Path. & Therap., Edin. & Lond., 1920, **33**, 153–158.

Great Britain being free from foot-and-mouth disease in the enzootic form is only invaded when the disease is prevalent on the Continent. Neither imported live stock nor hay and straw are the source of the infection in the areas of initial infections. Feeding stuffs, packing materials, and human beings are shown not to be the cause of the outbreaks which have occurred in the different areas of the country. These have been supposed in the past to be carriers of the virus of the disease. Air currents as carriers of the virus are suggested. Viscous slobbers from the mouth are taken up on such currents and disappear. Infection has been traced to this method over a distance of a few miles. Air currents may spread the virus over long distances. There is no general relationship established between migratory birds and the transmission of foot-and-mouth disease. Ducks, geese and gulls, which travel long distances for food, might frequent contaminated pastures and drinking places and carry the virus on feet and plumage. They might swallow infected material and afterward excrete the virus in an active state. Experiments to demonstrate these two possibilities are to be carried out.—C. E. H.

121. Der Neue Seuchengang der Maul und Klauenseuche. (*The Recent Spread of Foot and Mouth Disease.*) J. WIEMAN. Berl. tierärtzl. Wchnschr., 1920, **36**, 369–371.

Wieman discusses the cause of the recent spread of this disease, which, in some localities, has manifested itself in the malignant form, while in certain provinces, as Prussia, the benign form is more prevalent.

In November, 1914, there were 19,296 farms infected. In April, 1918, 32 farms were reported in all of Germany, while in July, 1920, the number reached 45,673 in Prussia and 118,728 in Germany. The virulence of the disease, and especially the post-war unsettled conditions—when a great deal of illegal trading of contraband farm products took place with attendant undesirability of enforcing rigid regulations—are held responsible for the extensive spread of the disease.

As the only proven effective preventive and therapeutic agent, the author considers Löffler's Foot and Mouth Disease Serum. It is, however, technically impossible to supply the demand.—J. T.

122. Tödliche Vergiftungen durch Verfüttern von Weizen-pressstroh, das stark mit Schimmelpilzen besetzt war. (*Fatal Poisoning through the Feeding of Pressed Wheat Straw Heavily Infected with Moulds.*) KRAENNER. Zschr. f. Veterinärk., Berl., 1916, **28**, 4–7.

Baled wheat straw, which was mouldy, caused death in a number of army horses and serious illness in many others. Nearly all the cases occurred in mares, the geldings rather peculiarly escaping for the most part.

The symptoms were those of lameness and partial or complete paralysis in all cases except one. This case showed little paralysis except that of the pharynx, but much evidence of cerebral disturbance as manifested by periods of mania. The temperature, pulse and respiration, in most cases, were normal. In later stages of the disease, the urine was cloudy and frequently bloody. The rectum was filled with hard dry feces covered with mucus.

All of the mares showed a purulent vaginal discharge and swelling of the vaginal mucosa in which bloody streaks were visible. Pharyngitis was present in most of the cases. Hemorrhagic gastroenteritis and nephritis were found at autopsy.

Treatment consisted in placing the animals in slings, the administration of strychnine, laxatives and diuretics. In cases of paralysis of the urinary bladder, catheterization was done twice daily.

Five animals died, one was killed, and 29 recovered. Many of these latter were very mild cases.—W. A. H.

123. *Ontsmetting van Emballage, gebruikt bij de verzending van veevoeder, vooral met het oog op de verspreiding van de smetstof van het mond—en klauwzeer. (Disinfection of Containers Used in Shipping Cattle Feeds Especially with regard to the Distribution of the Virus of Foot and Mouth Disease.)* L. F. D. E. Lourens. Med. v. d. Rijksseruminrichting, Rotterdam, 1918, **1**, 374–410.

Since containers of feedstuffs may distribute viruses of communicable disease, they should be disinfected each time before they are used. This disinfection can be done without demanding too much sacrifice from the factories or without causing delays in commerce: (a) For boxes: After thorough cleaning for a short time in streaming steam, or a longer period in hot, moist air. (b) For bags: After beating and brushing, exposure to formaldehyde gas. —L. V. E.

124. *The Presence of Micro-particles in the Blood and other Body Fluids.* S. H. Gage and P. A. Fish. J. Am. Vet. M. Ass., Wash., 1921, **58**, 384–402.

The existence of micro-particles in the blood is shown and their relation to the fatty portion of the diet demonstrated. Experimental data in connection with the absorption of fat are shown together with charts illustrating the fat curve of the horse, cow and dog. It is believed that the origin of these particles is in the fat and is dependent upon the food ingested. The milkiness sometimes found in serum is due to the presence of these fat particles. —W. A. B.

125. *Die praktische Verwendbarkeit der Komplementablenkungmethode für die Diagnose der Beschälseuche der Pferde. (The Practical Application of the Complement Fixation Test for Dourine of Horses.)* O. Waldmann. Berl. tierärztl. Wchnschr., 1920, **36**, 269–271.

The author reviews briefly the reported work on this subject.—J. T.

126. *De Bacillus pyo-septicus equi en de B. abortus equi als Oorzaak van Pyo-septicaemie z. g. Lahme bij Veulens in Nederland. (The Bacillus pyo-septicus equi and the B. abortus equi as the Cause of Pyo-Septicemia, so-called Joint Ill, in Colts in the Netherlands.)* L. de Blieck and T. Van Heelsbergen. Tijdschr. v. Diergeneesk., Utrecht, 1919, **46**, 492–496.

A report of 5 cases of pyo-septicemia in colts in which the organisms above mentioned were demonstrated.—L. V. E.

127. *Trichophytie en Microsporie bij het Paard. (Trichophytosis and Microsporosis in the Horse.)* T. Van Heelsbergen. Tijdschr. v. Diergeneesk., Utrecht, 1918, **45**, 477–485.

A description of the two diseases and methods of diagnosis. The microscopic characteristics of the two fungi and methods of cultivation are described, while the classification and macro as well as the microscopic appearances of the cultures are given.—L. V. E.

128. *Bacteriologische bevindingen bij eenige gevallen van Pyo-Septicaemie der Veulens. (Bacteriologic Findings in a Few Cases of Pyo-Septicemia of Colts.)* H. Van Straaten. Med. v. d. Rijksseruminrichting, Rotterdam, 1919, **2**, 40–48.

The author gives a number of brief references to the bacteriologic findings of other writers in cases of joint-ill in colts in order to show that in this disease different organisms have been considered the cause. Among his own cases, which were examined bacteriologically, 3 yielded streptococci only, 1 colon bacilli only, 1 paratyphoid B bacilli and streptococci, while in another case an organism was found which was provisionally named *Bacillus equuli*.

The latter are small, Gram-negative bacteria resembling oval bacilli.

On agar this bacillus grows as small, round, glistening, gray colonies which are in their entirety suspended in the condensation fluid. This characteristic is lost during continued cultivation on agar.

In bouillon, growth takes place exclusively on the bottom in the shape of tenacious clouds and threads, which cannot be divided by shaking. The bouillon itself remains clear.

On gelatin at 22°C. the growth is insignificant, just visible, without liquefication.

On potato, the growth is very slight. Milk is not changed by the growth, only the consistency becomes somewhat thicker. In peptone solution, the growth resembles that in bouillon, but is lighter. Lactose and glucose are not fermented by this organism.

The bacillus is but slightly pathogenic for mice. It resembles the one found at the Serum Institute during 1906.—L. V. E.

129. Versuche zur aktiven Immunisierung gegen die Rotzkrankheit der Pferde. (*Investigation on Active Immunization against Glanders in Horses.*) SCHÜTZ AND OTTO WALDMANN. Arch. f. wissensch. u. prakt. Tierh., Berl., 1920, **46**, 172–185.

These workers were unable to immunize horses against artificial infection by injection of glanders organisms killed by heating at 53° for one hour. They had previously determined that, heated at 50°, 51° and 52° for one hour, the bacilli would still produce infection in inoculated guinea pigs, even though they would no longer grow on culture media. When the bacilli were killed by dry heat, they protected one out of five against artificial infection.—J. T.

130. Über den diagnostischen Wert der Komplementbindungsmethode und der Agglutinonsprobe beim Rotz. (*The Diagnostic Value of the Complement Fixation and Agglutination Tests in Glanders.*) A. MARCIS AND R. MANNINGER. Berl. tierärztl. Wchnschr., 1920, **36**, 333–335.

A table is given showing results of serologic tests on 380 horses. In 362 of these animals, lesions of glanders were found upon autopsy. The authors, from further work, conclude that application of the ophthalmic mallein and serologic tests would yield 98 per cent of correct diagnoses.—J. T.

131. Desinfektion von Häuten rotzkranker Tiere mit Kalkmilch. (*The Disinfection of Hides from Glandered Animals with Milk of Lime.*) LUDWIG PFEIFFER. Arch. f. wissensch. u. prakt. Tierh., Berl., 1920, **46**, 62–86.

Pieces of skin affected with glanders and treated with milk of lime for 6, 12 and 24 hours respectively, and then inoculated into guinea pigs resulted in infecting 6 out of 6 receiving the skin treated with 1:100 milk of lime solution, and 5 out of 6 inoculated with 1:50 treated material, while in 3 other groups, of 6 guinea pigs each, inoculated respectively with skin treated with 1:30, 1:20 and 1:10, all remained well. *In vitro* he found that milk of lime in 1:5, 1:10, 1:20 and 1:50 killed *Bact. mallei* with certainty in 6 hours; 1:100 and higher dilutions were not effective in destroying these organisms. Pfeiffer concludes that horse hides with farcy lesions, treated under supervision with a freshly prepared 1:20 solution of milk of lime for 24 hours, are safe and should cause no concern. Hides so treated are not spoiled for the trade.—J. T.

132. Epidemisch aufgetretene Geschwürsprozesse nichtrotiziger Natur in der Nasenscheidewand unter den Pferden des Beskidenkorps. (*An Epizootic of a Non-Glanderous Ulcerative Process on the Nasal Septum among the Horses of the "Beskiden" Corps.*) ROTTSCHALK. Ztschr. f. Veterinärk., Berl., 1916, **28**, 1–4.

In one regiment operating in the Carpathian Mountains, 86 horses were found showing ulceration of the nasal septum and other parts of the nasal mucosa. The ulcers were situated, in all cases, 10 to 15 cm. from the nasal opening where the nasal passage is narrowest.

The borders of the erosions were irregular and in many cases the surfaces were covered with grayish-green necrotic membranes. The ulcers were generally elongated. The mucous membrane in the vicinity of the lesions was generally reddened. In some cases granulation tissue was present and healing apparently in process. A nasal discharge was seldom noticed. There was never any swelling of the lymph glands. The general condition remained good in all cases.

The ophthalmic mallein test was uncertain since the mallein had proven unreliable. Blood tests were negative. Five animals were killed and autopsied. They showed nothing suspicious of glanders aside from the nasal lesions.

Since the destruction of so many horses would have demoralized certain regiments, the affected horses were collected together and worked. They were fed and watered from separate containers and kept in stalls away from unaffected animals.

It is believed by the author that the nasal lesions were due to the inhalation of lime-laden dust, this being favored by the dusty mountainous roads on which they were worked.—W. A. H.

133. Contribution à l'étude de la transmission du Trypanosoma Cazalboui. (*A Contribution to the Study of Transmission of the Trypanosoma cazalboui.*) R. VAN SACEGHEM. Ann. de méd. vét., Brux., 1920, **65**, 369–374.

While working in the laboratory of Zambi (Bas-Congo) the author observed the existence of *Trypanosoma Cazalboui* var. *pigrita*, in cattle affected with souma. Its occurrence was in territory where no species of *Glossina* existed. He also made the observation that the first cases of trypanosomiasis developed coincident with the appearance of an *Hematopata* (*H. pertubans* (Edwards)); also that in infected regions there were many *H. pertubans*, especially in the larval state existing in the neighborhood of swamps. He believes and cites proof for his view that this fly acts as a direct carrier, transmission being by contaminated biting mouth parts, etc. Probably other insects are capable of transmitting this trypanosome in a similar manner, such as the *Stomoxydae*, the *Lyperosia* and mosquitoes and ticks.—D. C. B.

134. Vaccination Against Anthrax in Brazil. A. MOSES. Revista Vet. e Zootech., 1919, **9**, 3–10.

"Three vaccines used in Brazil against anthrax are described. The first consists of a culture in 2 per cent peptone solution of anthrax bacilli attenuated by heating for twelve days at a temperature of 42°C. It is used for bovines in a single dose of 2 cc., corresponding to eight times the dose formerly used according to the classic method of Pasteur in two inoculations at 15 day intervals. The best results for other animals have been obtained by using 1 cc. for horses, donkeys, and hogs, and 0.5 cc. for calves and sheep. The second vaccine is prepared in a similar manner with slight variations, and is used in doses of 2 cc. for adult animals indiscriminately. The third is a spore vaccine prepared by growing on a solid culture medium at 35°C. to 37°C. for several days a mixture of different strains of anthrax bacilli of attenuated virulence. An emulsion of this culture rich in spores is prepared in appropriate solution and heated to 60°C. for several hours. It is used in doses of from 0.5 to 1 cc., the dose being repeated ten times. The first vaccine, which is in use officially by the Brazilian Department of Agriculture, is considered the most satisfactory, and is said to have better keeping qualities than the Pasteur vaccine." (Abs. Exp. Sta. Record, 1919, **41**, 378.)—W. A. H.

135. Besmettelijk Verwerpen bij het Rund. (*Contagious Abortion in Cattle.*) K. BÜCHLI. Med. v. d. Rijksseruminrichting, Rotterdam, 1917, **1**, 121–205.

The author introduces the subject by a discussion of the economic importance of the disease. This is followed by chapters devoted to the following details: historic considerations, definition, etiology, biology, pathologic anatomy, modes of infection, pathogenesis and course of the disease, symptoms, diagnosis, bacteriologic diagnosis, diagnostic inoculations, ophthalmo reaction, agglutination and complement fixation, immunity and immunization, active immunization, control measures, and sanitary police measures.

To this is added a bibliography of the more modern authors.—L. V. E.

136. Bovine Lymphangitis. A. L. SHAETHER. J. Comp. Path. & Therap., Edin. & Lond., 1920, **33**, 158–185.

Pus taken from natural cases of bovine lymphangitis reproduces the disease in plains calves to the extent that subcutaneous inoculation led to abscess formation and suppuration of the nearest lymph gland. The lesion developed slowly, the gland showed little tendency to burst spontaneously, there was no fever and no general disturbance of health. Male guinea pigs developed suppurative orchitis in a large number of cases from intraperitoneal inoculation. Pus from these lesions of both plains calves and guinea pigs reproduced the symptoms when injected into other animals of like kind. Bovine lymphangitis is said to occur in two distinct forms, one caused by a streptothrix (Nocard) and the other by a bacillus (Vryburg and Raymond). The organism described in the author's paper agreed in most characters with the description of Vryburg and Raymond. There are some minor differences. The organism also agrees with the characteristics of the Preisz-Nocard bacillus but is Gram-negative.—C. E. H.

137. Nephritis purulenta disseminata (Kitt) hos Kalve. (*Nephritis Purulenta Disseminata (Kitt) in Calves.*) M. CHRISTIANSEN. Kgl. Vet.-og Landbohøjsk., Aarsskr., 1919, København, pp. 92–112.

In calves a characteristic nephritis is sometimes met with, in which small yellowish lesions are surrounded by a hemorrhagic zone. The lesions, confined to the cortex of the kidney vary from the size of a millet seed down to those that are just visible to the naked eye. As a rule they are not evenly distributed but are collected into large or small groups. The disease is no doubt identical with that named by Kitt nephritis purulenta disseminata or acute purulent embolic nephritis of calves.

Sixteen cases of the disease have been examined by Christiansen. From 15 of the 16 cases studied, the author obtained pure cultures of *B. coli*, in one a bacterium was found that belonged to the group formerly described at the Copenhagen school under the name of *B. metacoli*. It differed from *B. coli* in fermentative and serological reactions. The colon bacilli, divisible into two types, were identical with those found in coli-bacillosis (white scours) of calves. In four of the cases inflammation of the umbilicus was associated with the nephritis, and in the umbilical lesions colon bacilli were found identical with those found in the kidney of the same animal.

Histologically the lesions showed a high degree of infiltration with polymorphonuclear leucocytes and a varying number of lymphocytes. The lesions consisted almost exclusively of these cells. The normal kidney tissue had quite disappeared, the remains of epithelium being visible only here and there. There was no actual suppuration, and the disease must on the whole be considered as benign. The lesions probably become replaced by the formation of connective tissue with ultimate cicatrisation. In acute cases there was severe hyperaemia and degeneration; in the more chronic the picture resembled that of an indurative nephritis.

B. coli nephritis ought to be distinguished from fibroplastic nephritis, and ought to be judged more strictly than the latter in meat-inspection. (Abs. in Vet. Rev., Edinb., 1920, **4**, 291.)—W. A. H.

138. Saria. H. H. CURSON. Vet. J., Lond., 1920, **76**, 405–412.

Saria is a term applied to a peculiar form of dermatitis as found in the late German East Africa. It affects the unpigmented skin only. The contagiousness of this disease was studied by trying to transmit it artificially but with negative results. A differential diagnosis from some of the better known tropical dermates is given.—H. C. H. K.

139. *Der seuchenhafte Abortus beim Schwein.* (*Infectious Abortion of Swine.*) O. Zeh. Berl. tierärztl. Wchnschr., 1920, **36**, 257–259.

The author obtained a bacillus belonging to the paratyphoid-Gärtner group from the organs and body fluids of fetuses which were aborted in the twelfth week of pregnancy. He obtained a similar organism from all the organs of a pig on another farm, which died soon after being farrowed. Zeh reports similar findings from two aborted fetuses from still another farm.—J. T.

140. *The Susceptibility of Young Pigs to Cholera.* E. M. Pickens, M. F. Welch and L. J. Poelma. J. Am. Vet. M. Ass., Wash., 1921, **58**, 403–412.

From their data the authors conclude the following: (1) Many baby pigs born of and suckling immune mothers, from ages of 2 to 55 days, withstand exposure to 1 cc. of hog-cholera virus; (2) in case the mother contracts the disease all but the double treated pigs soon take sick and usually die from cholera; (3) most pigs weaned at ages of from 48 to 78 days which have been born of immune mothers usually contract cholera after exposure to 1 cc. of the virus when not previously immunized; (4) the milk of immune mothers would appear to have some influence in maintaining the immunity of suckling pigs; (5) in case of grave danger or known exposure of weaned pigs to cholera, some method of immunization should be employed immediately.—W. A. B.

141. *Protozoan Forms and Their Relation to Diarrhea and Colitis in Shoats.* W. W. Dimmock. J. Am. Vet. M. Ass., Wash., 1921, **58**, 413–426.

Microscopic examination of the intestinal tract of 75 pigs was made. These pigs showed symptoms of the sort usually found with necrobacillosis and kindred affections. A summary of the examinations of the intestinal contents indicates that *Trichomonas suis* is found consistently in cases of colitis that show typical symptoms and lesions of intestinal necrobacillosis.—W. A. B.

142. *Cocidien van het Scheap en het Varken.* (*Coccidia of Sheep and Swine.*) J. B. Douwes. Tijdschr. v. Diergeneesk., Utrecht, 1920, **47**, 407.

A brief note describing the finding of certain coccidia in sheep and swine.—L. V. E.

143. *Op Boutvuur gelijkende Spieraandoenig bij Kalveren veroorzaakt door een coliachtige bacil.* (*Muscle Lesion in Calves Resembling Black-leg, Caused by a Coli-like Bacillus.*) H. Warnecke. Tijdschr. v. Diergeneesk., Utrecht, 1917, **44**, 537–539.

An affection of the adductor muscles of the thigh of a very young calf is described, which closely resembled black-leg. The subcutaneous connective tissue was very edematous, and of amber color. The muscles were swollen and hemorrhagic and section showed them to be emphysematous, ranging in color from red to dark brown. No odor could be observed. The black-leg bacillus could not be demonstrated, but the tissues contained in pure culture a bacillus which proved to be Gram-negative, motile and which failed to liquefy gelatin. It formed gas in glucose and lactose media in abundance. Some gas was formed in saccharose but in slight quantity.

On Endo, Conradi-Drigalski and malachite green agar and in litmus-whey substitute according to Leitz, the growth resembled that of the colon bacillus.

The organism caused no reaction in a rabbit after intravenous injection, but intraperitoneal injection of a guinea pig gave rise to a purulent inflammation of peritoneum, pleura and pericardium.—L. V. E.

144. *Eene Konijnensterfte.* (*A Fatal Disease of Rabbits.*) W. Luxwolda and H. A. Zwijnenberg. Tijdschr. v. Diergeneesk., Utrecht, 1918, **45**, 491–493.

A fatal disease occurred among the young rabbits (2–4 weeks old) of a coöperative rabbit breeding station.

The rabbits were being housed in a manner quite satisfactory from a sanitary point of view. From time to time the young animals and their dams were placed in movable runs. The animals were fed with cut grass, roots and milk. The cows furnishing the milk were kept in the same yard.

The young rabbits died suddenly without observable prodromal symptoms. They suddenly fell on their sides and were seized with convulsions and died within a few moments. Hemorrhagic septicemia was suspected. Autopsy on about 10 animals revealed a fair state of nutrition, pale mucosa, internal organs hyperemic, no hemorrhages of the serous membranes, contents of the small intestines normal and firm, in the large intestines a hyperemic mucosa, a few punctiform hemorrhages and contents somewhat softer than normal; spleen firm, not enlarged; lungs, heart, kidneys and brain normal.

Slides made from the heart, liver, lungs, spleen and intestines were stained with Löffler's methylene blue, and Gram. Gram-positive diplococci were found in the preparations from the heart, liver and intestines.

Agar cultures after 24 hours showed mother-of-pearl gray, glistening colonies of Gram-positive diplococci. Hemorrhagic septicemia was thus excluded and a connection between the disease and the feeding was suspected.

The milk of one of the cows had been under suspicion for a few weeks. The milk did not taste good and a rice soup prepared with it could not be eaten. In a mixed sample of the milk (of cows I, II, and III), a few streptococci and diplococci were found.

The milk of the 3 cows examined separately gave the following results:

Cow I. A few short streptococci, sediment according to Thommsdorf 0.2.

Cow II. A few short streptococci, some diplococci; sediment 0.2.

Cow III. A few streptococci, many diplococci; sediment 0.4. Agar culture yielded the same growth of diplococci as described above. Mice inoculated with bouillon cultures made from the milk of cows II and III succumbed after 6 and 4 hours. That which received culture from cow I survived. Feeding experiments failed to give positive results.

Cows I and II were found to be perfectly normal, while cow III was suffering from a severe enteritis, with thin, fetid feces of light green color but in which diplococci could not be found. The udder of this cow was large and square, the color of the milk, light yellow and the katalase index not increased. The disease disappeared soon after the use of this milk was discontinued.—L. V. E.

145. De Klein'sche Kippenziekte. (*Klein's Chicken Disease.*) H. Van Straaten and B. J. C. Te Hennepe. Med. v. d. Rijksseruminrichting, Rotterdam, 1917, **1**, 80–102.

A study of a chicken disease described by Klein as fowl enteritis and apparently identical with the one known in this country as fowl-typhoid. The paper includes a description of the causative organism, *B. gallinarum*, its cultural characteristics, its biologic relation to other members of the typhoid-colon group and its pathogenicity. The authors suggest control measures and relate their experiments with immunizing agents.

A vaccine was prepared by suspending an 18-hour agar slant culture in 50 cc. of physiologic salt solution and heating for one hour at 60°C. An antiserum was also prepared in which horses and cattle were used. The results of vaccine and serum were quite favorable although the authors recognize the limitations of the methods they describe.—L. V. E.

146. Beziehungen zwischen dem Erreger des Infecktiosen Abortus der Rinder und des Maltafiebers. (*The Connection Between the Causative Agent of Infectious Abortion of Cattle and that of Malta Fever.*) Zeller. Berl. tierärtzl. Wchnschr., 1920, **36**, 345.

Zeller compares the morphologic and biochemic cultural characteristics of the two organisms. He performed serologic tests, using antisera from field and artificially inoculated cases, and comes to the conclusion: "That it was impossible for us to detect a decided difference between the causative agent of infectious abortion of cattle and that of Malta fever. The epidemiologic behavior of both diseases is, in part, very similar. On various grounds, the identity of the organisms is not admissible from the above, but our investigations hardly leave a doubt that both are at least closely related. In some respects, our work needs supplementing."—J. T.

147. Hundesyphilis. (*Canine Syphilis.*) von Niessen. Berl. tierärztl. Wchnschr., 1920, **36**, 285.

The author had been treating a case of syphilis in a servant girl. His attention was directed to a dachshund with small, exudative, pustular eruptions on the abdomen and thigh, which conformed with findings in human syphilis. The dog slept with the maid. Blood cultures in three tubes, the author states, yielded pure culture of the syphilis organism.

F. Gross, assistant in the small animal clinic at the Dresden Veterinary High School, where the cultures from the blood were made, disclaims any responsibility for the diagnosis of syphilis in the dog. He states that the pustular eruptions, mentioned by von Niessen, presented a picture of acute exanthematous form of distemper, and that similar eruptions are sometimes also observed in old dogs suffering from autointoxication, urticaria, or may result from external irritants.—J. T.

PARASITIC DISEASES

(*See also Numbers 133, 142, 235*)

148. A New Bi-Flagellated Protozoan of Man. T. Wight and B. Lucke. J. Parasitol., Urbana, Ill., 1920, **6**, 140–143.

"A small biflagellated protozoon was found in direct smears and in cultures from three postmortems of patients dead from acute influenza. They occurred, respectively, in the heart's blood, sphenoidal sinus and the lung, and apparently produced no tissue changes. The organisms were round or pear-shaped, possessed two free flagella and a kinetonucleus. They were easily cultivated on rabbit's blood glycerin agar." The authors regard these organisms as accidental invaders, possibly belonging to the genus *Prowazekia*.—W. A. R.

149. Notes on the Identification of Anophelinae and Their Larvae in the Zanzibar Protectorate. W. Mansfield-Aders. Bull. Entomol. Research, Lond., 1920, **10**, 329–332.

Simple distinguishing characteristics of the adults of the 4 species of *Anopheles* and of 3 species of larvae.

Of interest to other workers is the suggestion that a larva for microscopic examination be anaesthetized by putting it in a drop of water on the slide and then placing near it a pledget of cotton soaked in chloroform and covering all with an inverted petri dish for a few minutes. The larva can then be moved about and turned by means of a fine dissecting needle with a minimum of injury to its finer hairy structures.—W. A. R.

150. *Malaria Drainage Operations at the Port of Embarkation, Newport News, Virginia.* W. B. HERMS. Mil. Surgeon, 1920, **47**, 81–93.

The camps constituting the port of embarkation at Newport News were in the midst of swamps breeding millions of malaria bearing mosquitoes, which had abundant access to human reservoirs of the disease.

The usual methods of draining and of oiling pools, water barrels, and other possible sources of mosquitoes in the neighborhood of camp were applied. Where the location and the nature of the work done by the troops rendered them especially liable to infection, the use of head-nets, repellants for the hands and wrists, mosquito bars, and a bi-weekly dose of 30 grains of quinine were enforced.

A total of 144 cases of malaria were treated at the embarkation hospital during the malarial season of 1918. Of these, 100 cases had been contracted elsewhere. No data are available to show whether men quartered in the camps for a few days did not become infected and manifest symptoms only after they had embarked for over-seas. The author thinks that in the absence of such information, it is fairly safe to assume that such infection did not occur.—W. A. R.

151. *Emergency Measure and Foresight in Malaria Control.* L. D. FRICKS. Mil. Surgeon, 1920, **47**, 224–229.

The necessity for emergency malaria-control measures is frequently created by lack of knowledge or by causes that should have been foreseen. Thus, towns have grown, contractor's camps, villages of employes of industrial plants, and more recently military and naval camps have been located in districts particularly favorable for propagation of malaria mosquitoes.

When precautions are observed, there may be hidden dangers of anopheles production. Two items most frequently over-looked are seasonal floatage and certain forms of aquatic vegetation, Again, in waters subject to tidal action, floating eel-grass and other aquatic growths may prove serious factors. Drainage and oiling and the use of larvacides are not sufficient in handling an emergency situation, as they demand time for results. Mosquito nets, salves, and repellant solutions are inefficient. By taking advantage of the habits of adult anopheles mosquitoes an emergency measure of decided practical value is found in destroying of engorged malarial mosquitoes.—W. A. R.

152. *Uebertragung latenter Malaria bei direkter Bluttransfusion.* (*Transmission of Latent Malaria in Direct Blood Transfusion.*) F. OEHLECKER. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1025–1026.

Tertian malarial fever began within 14 days in the recipient of 1 litre of transfused blood. The donor had a latent infection that had never, so far as he could recall, given any of the usual signs of its presence.—B. C.

153. *Ueber wichtigere Probleme der modernen Malariaforschung.* (*The More Important Problems in Modern Malaria Research.*) HANS ZIEMANN. Berl. klin. Wchnschr., 1920, **57**, 659–663; 687–690.

In spite of great progress made, there is a vast amount of work to be done before the malaria problem can be considered solved. Ziemann reviews the present status in different phases of the problem and indicates important points that still lack evidence or confirmation. —B. C.

154. *Ueber Malariafälle ohne nachweisbaren Milztumor.* (*Malarial Cases without Demonstrable Splenic Tumor.*) RICHARD OFFENBACHER. Berl. klin. Wchnschr., 1920, **57**, 493–494.

Two cases are described in which there was no splenic enlargement during the course of an attack of tertian fever. The parasites were observed in the blood and the cases responded to quinine treatment.—B. C.

155. *The Effect of Emetine on Entamoeba histolytica in Stools.* WILLIAM ALLAN. J. Pharmacol. & Exper. Therap., Balt., 1920, **16**, 21–33.

Emetine did not affect the apperance or motility of *Entamoeba histolytica* in stools in dilutions lower than 1:2000 in 1 to 2 hours; and often dilutions as strong as 1:150 were ineffective within this time.—F. W. H.

156. *The Intestinal Protozoa: Method of Diagnosis and Treatment.* SIDNEY K. SIMON. South. M. J., Birmingham, 1920, **13**, 569–573.

A descriptive article covering the subject of diagnosis and treatment of protozoal infections.—J. H. B.

157. *Clinical and Anatomopathological Aspects of American Trypanosomiasis.* CARLOS CHAGAS. N. Orl. M. & S. J., 1920, **72**, 630–660. (Transl. by Lodilla Ambrose from Prensa medica argentina, Buenos Aires, 1916, 3.)

American trypanosomiasis caused by *Trypanosoma cruzi* exhibits two distinct developmental phases related chiefly to the localizations of the parasite. In the first phase, that of recent infection, the trypanosome is found in the circulating blood, in the second, that of chronic infection more or less remote, the parasites disappear from the periphery and remain in activity in the interior of tissues, under the aspect of non-flagellate Leishmaniform corpuscles.

The parasites of the tissues undergo a continuous development and transformed from Leishmaniform corpuscles into typical trypanosomes they return to the blood. The fact that the flagellates cannot be found in the blood in chronic cases, in spite of this cycle, is due to the establishment of an immunity, which makes difficult or impossible their life in that medium.

Whenever the flagellate may be demonstrated in the blood there is fever whose intensity varies directly with the abundance of the parasites.

One of the most frequent, if not constant, symptoms in the acute forms of the disease is a myxedema, due to functional disturbance of the thyroid gland. Other symptoms in acute cases are occasional conjunctivitis, and more characteristic keratitis; frequently photophobia, orchitis in man, and cutaneous processes, sometimes burning.

The chronic infection lacks the great excessive symptoms of the acute phases. Related to the profound alterations of the myocardium, due to the localizations of the protozoan, the cardiac syndrome constitutes one of the most notable symptomatic characteristics. The extra-systoles and the premature systoles of auricular or ventricular origin constitute constant phenomena. In the high mortality, the decline of the myocardium is the preponderating factor.

The central nervous system is a frequent focus of pathologic processes which make themselves evident in profound functional changes. Motility, the intelligence, speech, etc., suffer profound alterations. In its nervous manifestations American trypanosomiasis is comparable to syphilis.

In the regions studied by the author in Brazil goitre is always observed, constant in persons who live in houses infested by *Lamus megistus*, the insect vector of the trypansomiasis. On the other hand, those who live in houses free from the insect do not present hypertrophy of the thyroid or other symptoms of the disease, though all the other conditions of life, alimentation, water, general habits of existence, are identical.

The paper closes with notes by the translator calling attention especially to different names applied to the insect host. To this should be added that the correct name, zoologically, is *Lamus megistus* and fortunately this is being adopted by the better texts.—W. A. R.

158. *Die neueren Ergebnisse der Haemoproteus-Forschung. Zugleich vorläufige Mitteilung über das Kreuzschnabel-trypanosoma and über Züchtungsversuche an einigen anderen Trypanosomen. (New Results of Investigations of Haemoproteus. Also, Preliminary Report on the Trypanosome of the Crossbill and on Attempts to Culture Certain Other Trypanosomes.)* W. Nöller. Arch. f. Protistenk., Jena, 1920, **41**, 149–168.

An excellent review of the extensive work on *Haemoproteus* since Schaudinn's time closes with the observation that satisfactory conclusions have not yet been reached. The developmental process in birds is well known but that in the insect vector is far from clear. The author's own experiments are then reported.

An essential preliminary to the work was the study of blood-sucking parasites of nestling birds, since infection takes place in the nest. For this study the most available nestlings were starlings (*Sturnus vulgaris*) and chimney swallows (*Hirundo rustica*) and one nest each of *Hirundo urbica* and *Strix flammea*. In the nests of these birds were found: (1) louse flies (*Ornithomyia avicularia*); (2) *Carnus hemapterus* (Dipteron); (3) *Protocalliphora* larvae (Dipterus); (4) bugs related to the bed-bug; (5) bird fleas (*Ceratophyllus spec*); and (6) *Dermanyssus* mites.

Of these parasites, the bugs and the *Protocalliphora* larvae can be excluded because they are much rarer in the nests than the *Haemoproteus* infection. Mosquitoes (fleas?) and the bird-mites can be excluded or fresh infections of adults birds would be much more common. The choice then narrows down to the louse flies and the apparently widely distributed fly, *Carnus hemapterus*.

Louse flies, on account of their great activity and the fact that they feed poorly or not at all under reagent glasses were exceedingly difficult to experiment with and extended attempts to transmit the *Haemoproteus* of the crossbill by means of *Ornithomyia fringilla* were failures.

Haemoproteus material for laboratory experiments was secured from a heavily infested cross bill (*Loxia curvirostra* L.). From its blood ookinetes were brought to full maturity in 3–4 days in a moist chamber at high summer temperature. Within 2 days there also appeared in the moist chamber the culture form of a trypanosome which was readily transferred to and grew upon grape sugar—sheep- or horse-blood agar. Later a trypanosome was found free in the fresh blood of the bird. It is described as a new species, *Tryp. loxias*. Injections of cultures maintained at 37°C. regularly infected crossbills, canaries, and siskins. Mosquitoes (*Culex pipiens* and *Stegomyia fasciata*) were successfully infected by feeding on infested birds.

In none of the birds artificially infected with trypanosomes did the *Haemoproteus* infection appear. Experiments were then carried out with various blood-sucking arthropods.

In the mites, *Dermanyssus avium* formed ookinetes. In the bird flea *Hectopsylla psittaci* a flagellating microgametocyte was seen in one instance; ookinetes could not be found. Young bedbugs kept at 20°C. showed numerous completely developed ookinetes after 20, 42, 66 hours, but none after 116 hours. At 30°C. they were found after 20 hours but not after

66 hours. No ookinetes were seen in bed bugs at 37°C. The *Haemoproteus* readily developed ookinetes in *Stegomyia fasciata* but experiments with *Culex pipiens* resulted negatively.

Owing to lack of material at the critical time experiments could not be carried out with *Carnus hamapterus*. As already noted all efforts to induce *Ornithomyia fringillina* to feed were failures. The author however considers the species the most probable carrier of the infection.—W. A. R.

159. Trypanosomen bij het Schaap. (*Trypanosomes in Sheep.*) J. B. Douwes. Tijdschr. v. Diergeneesk., Utrecht, 1920, **47**, 408–409.

The author succeeded in demonstrating typanosomes in the blood of sheep by the following method: Defibrinated fresh blood of sheep was added to bouillon tubes in the proportion of one part blood to two parts of bouillon. The tubes were then incubated at 30°C. The trypanosomes were found in the layer between the settled blood and the bouillon after 9 days. It is more correct to speak of forms of development than of trypanosomes in this case because the protozoa observed do not resemble the parasites as found in mammals. Adult trypanosomes were however found in original blood preparations but in very small numbers. —L. V. E.

160. Babesiose en Babesiaparasieten in Nederland. (*Babesiosis and Babesia parasites in the Netherlands.*) A. Vrijburg. Tijdschr. v. Diergeneesk., 1918, **45**, 535–549; 563–578.

The author calls attention to the discoveries of Babes in Rumania and of Smith and Kilborn in the United States. The part played by ticks is mentioned and a description of *Ixodes ricinus* and its life history are given. This tick is the only one thus far found in the Netherlands.

The Babesia parasites, their nomenclature, method of reproduction and the transmission of the infection are discussed and numerous illustrations are added to the paper. The differential diagnosis and the microscopic examination of the parasites are given full consideration, while the therapy and the prophylaxis also receive attention.

A discussion of the author's experimental efforts concludes the paper.—L. V. E.

161. Bacterieele infectie door het percutaan Indringen van Larven van Strongyloides. (*Bacterial Infection by the Percutaneous Penetration of Larvae of Strongyloids.*) L. de Blieck and E. A. R. E. Baudet. Tijdschr. v. Diergeneesk., Utrecht, 1920, **47**, 501–502.

The authors showed experimentally that during the penetration of the skin by the larvae of *Strongyloides westeri*, it is possible for all kinds of bacteria to be introduced into the body.—L. V. E.

162. A Case of Multiple Lesions in Leishmaniasis. O. Torres. N. Orl. M. & S. J., 1920, **73**, 61–66.

A native of Bahia, Brazil, exhibited 248 monomorphous lesions of leishmaniasis. The writer believes it to be a record case.—W. A. R.

163. Spirochaeta recurrentis: A Filter Passer. J. L. Todd. J. Parasitol., Urbana, Ill., 1920, **6**, 152–154.

It is found that *Spirochaeta recurrentis* can be forced in its type form through a "W" Berkefeld filter. Centrifugalization, at the speeds and for the times employed does not throw down all infective forms of *Spirochaeta recurrentis*.—W. A. R.

164. Die Spirochätenkrankheiten besonders der Tropen im Lichte der Neuesten Forschungen. (*Spirochetosis, Especially of the Tropics, in the Light of the Most Recent Investigations.*) W. Hoffmann. Berl. klin. Wchnschr., 1920, **57**, 757–760; 786–788.

A general review of the subject is given in relation to some of the modern immunological aspects.—B. C.

165. Clinico-microscopiccl Observations on Filariasis. A. M. Alvarez. N. Orl. M. & S. J., 1920, **72**, 701–706. (Transl. by Lodilla Ambrose from Alvarez, A. Martinez. Observaciones clinoc-microscopicas sobre la filariasis (trabajo leido ante la Asamblea de la Associacion Medica de Puerto Rico, Diciembre 11 y 12, 1915). Bol. Med. de Puerto Rico, San Juan, 1916. xiii, 17–21. 2 charts.)

Puerta de Tierra, Porto Rico, is a filarial district and should be so recorded. Since clinical diagnosis is obscure, microscopic study should be made in the case of any patient of this district who shows fever.

From a study of fifty cases, covering a period of a year, the author notes the following clinical forms which he believes the disease to present: (1) Comatose form in children; (2) epileptoid form; (3) pseudotyphoid form; (4) premature child-birth and abortion as premonitory symptoms, or symptoms subsequent to the attack of acute filariasis; (5) certain classes of abscesses.

During an acute attack there exists a polymorphonucleocytosis reaching at times to thirty thousand. After the attack is over in some cases there is a periodical nocturnal eosinolymphocytosis. This periodic attack corresponds to the lunar period included between the fourth quarter and the new moon, the author's studies confirming a popular belief to this effect.—W. A. R.

166. *Coccidien-infectie bij het Rund.* (*Coccidia Infection in Cattle.*) L. DE BLIECK AND I. B. DOUWES. Tijdschr. v. Diergeneesk., Utrecht, 1920, **47**, 139–148.

A description of coccidiosis in cattle caused by *Eimeria zürni*. The symptoms, etiology, sporogony and infection experiments are considered, while a more or less complete bibliography is added to the paper.—L. V. E.

167. *A Case of Multiple Echinococcus Cyst.* H. W. JONES. Mil. Surgeon, 1920, **47**, 219–223.

A case report of a private who was operated upon and finally died from presence of echinococcus infection of the liver and spleen.—W. A. R.

168. *Sur la source d'infection du chien et du chat avec l'Echinochasmus perfoliatus* (*v. Ratz*) *et la question d'infection de l'homme avec les distomes de la famille des echinostomides.* (*The Source of Infection of the Dog and Cat with Echinochasmus perfoliatus* (*v. Ratz*) *and the Question of Infection of Man by Distomes Belonging to the Family Echinostomidae.*) J. CIUREA. J. Parasitol., Urbana, Ill., 1920, **6**, 173–177.

Carefully checked experiments showed that infestation of dogs and cats by *Echinochasmus perfoliatus* was caused by the ingestion of various raw fish from the Danube, notably the tench (*Tinca tinca*) and the roach (*Idus idus*). In these fish the minute larvae were found encysted in the scales especially along the lateral line.

These findings suggest that the infection of man by Echinostomidae is caused by the consumption of raw fish.—W. A. R.

169. *Den Wiederkäuer Infusorien verwandte Formen aus Gorilla und Schimpanse.* (*Infusoria from the Gorilla and Chimpanzee Related to Those of Ruminants.*) E. REICHENOW. Arch. f. Protistenk., Jena, 1920, **41**, 1–33.

The discovery of infusoria, closely related to *Ophryoscolex* of ruminants, in the intestine of a gorilla, was followed by the finding of another species in the chimpanzee, a variety of *Troglodytella abrassarti* Brumpt and Joyeux 1912. There is no evidence that the species are pathogens. Detailed descriptions of the new species *T. gorillae* and *T. abrassarti acuminata* are given. There is no evidence that these forms are pathogens.—W. A. R.

170. *On a New Species of Rhabitoid Worms Found in the Human Intestines.* HARUJIRO KOBAYASHI. J. Parasitol., Urbana, Ill., 1920, **6**, 148–151.

In feces examinations of pupils of a primary school in Ibaraki Prefecture, Japan, 17 out of 668 examined (2.5 per cent) were found to be infected by a new viviparous nematode which is described as *Rhabditis hominis* n. sp.

Full-grown females measure 1.5 to 2 mm. in length; males, 0.9 to 1.2 mm. All stages of development occurred in the same specimen of feces. No eggs are found in the feces, a point readily distinguishing the worm from *Strongyloides stercoralis*, with which it has probably been confused in Japanese literature.—W. A. R.

171. *The Biological Relationships of Ascarids.* BENJAMIN SCHWARTZ. J. Parasitol., Urbana, Ill., 1920, **6**, 115–123.

The blood serum of rabbits immunized to salt solution extract of *Ascaris lumbricoides* (from swine) causes the formation of precipitates when added to salt solution extracts of various ascarids (*Ascaris, Belascaris, Toxascaris, Ascaridia*). This precipitation reaction is therefore a group reaction.

By the use of proper dilutions, heavier and more rapidly appearing precipitates are produced when rabbit serum immunized against *Ascaris lumbricoides* is added to salt solution extracts of *A. lumbricoides* than when added to similar extracts of other ascarids. Extracts of *A. lumbricoides* from man do not appear to be distinguishable from those of *A. lumbricoides* from swine.

Small quantities of precipitating solution sufficient to cause the formation of precipitates in salt solution extracts of ascarids failed to produce precipitates in similar extracts of unrelated nematodes (*Dictyocaulus, Strongylus*).—W. A. R.

172. *On the Resistance of Ascaris Eggs.* SADAO YOSHIDA. J. Parasitol., Urbana, Ill., 1920, **6**, 132–139.

Eggs of *Ascaris lumbricoides* kept in 0.6 per cent nitric acid, 1 per cent hydrochloric, 5 per cent hydrochloric, 7 per cent glacial acetic, and 10 per cent formalin were alive at the end of the fifty-second day. Those in 7 per cent sulphuric acid develop into embryos but sooner or later they all die.

In 0.5 per cent carbolic acid or 20 per cent formalin, ascaris eggs are unable to develop into embryos; in 10 per cent sulphuric or glacial acetic acid or 15 per cent formalin they developed embryos but all were dead the forty-ninth day. Those in 15 to 20 per cent hydrochloric acid could not develop by the fourteenth day. Embryos cultured in 0.5 per cent potassium permanganate emerged from the eggshell alive. The eggs are unable to develop and ultimately die in human urine.

Experiments to determine the resistance of ascaris eggs to cold are briefly reported upon, but without data as to the out-of-door temperature to which they were subjected.—W. A. R.

173. *Criteria for the Differentiation of Schistosome Larvae.* E. C. Faust. J. Parasitol., Urbana, Ill., 1920, 6, 192–194.

The number and type of the mucin glands is the most dependable basis of separating the human *Schistosome cercariae.*

S. japonicum has 5 on each side, with ducts passing ventral to the nervous system and hence through the heavy muscular region of the mouth. They are large organs with granular acidophilic cytoplasm and large nuclei with basophilic reaction.

The larva of *S. haemotobium* has only 3 pairs of mucin glands, with a corresponding number of ducts opening strictly lateral to the orifice. The glands have small nuclei and give a simple acidophilic reaction.

In larvae of *S. mansoni* there are 6 pairs of glands, with an equal number of ducts which are arranged around the orifice dorsolaterally in the form of two compressed crescents. Two of the glands are acidophilic with large nuclei while 4 are basophilic and have small nuclei.—W. A. R.

174. *The Intermediary Host of Schistosomum mansoni in Venezuela.* J. Iturbe and E. Gonzalez. N. Orl. M. & S. J., 1920, 72, 696–701. [Transl. by Lodilla Ambrose from Iturbe and Gonzalez, Eudoro. El huesped intermediario de *Schistosomum mansoni* in Venezuela. Edicion especial ordenanda por la Academia Nacional de Medicina (Caracas, 1917)].

The frequency of occurrence of *Schistosomum mansoni* in Caracas led to search for the intermediate hosts of the fluke.

Experimental infections were secured in the following snails: *Ampullaria luteostoma* Swaine, *Planorbis cultratus* Orb, and *Planorbis guadelupensis* Sowerby. The last mentioned seemed to be the natural host, as high as 30 per cent having been found infected in some examinations.

In laboratory experiments the miracidia promptly emerged and made their way into exposed snails. The cercariae were adult by the end of the sixth week and were shown to be capable of infecting white mice, new-born rabbits, and dogs through the skin or by means of feeding livers of infected snails.—W. A. R.

175. *Variation of the Ovum (Sarcoptes scabiei) under Coverglass Pressure.* F. D. Weidman. J. Parasitol., Urbana, Ill., 1920, 6, 155.

Under coverglass pressure the eggs of *Sarcoptes scabiei* in about 16 minutes showed an increase of 12.6 per cent in length and 15.4 per cent in width. This factor should not be overlooked in comparison with known or in describing new species.—W. A. R.

176. *Notes and Experiments on Sarcocystis tenella Railliet. III. Is Sarcocystis tenella an Aberrant Form of one of the Cnidosporidia of Insects?* John W. Scott. J. Parasitol., Urbana, Ill., 1920, 6, 157–166.

A series of experiments extending over 4 years led to the conclusion that Darling's hypothesis that *Sarcocystis tenella* is an aberrant form of one of the Cnidosporidia of insects "is probably untenable."

It was found that lambs are more certain of becoming infected, and that the number of parasites per unit of muscle is greater if they are kept closely confined in a screened cage, protected from insects, than if they are allowed to run free in an open, dry lot. A second host not seeming necessary for the development of *S. tenella*, "it is concluded that a sexual stage is to be found in the intestine of the sheep."—W. A. R.

177. *Untersuchungen über Octomitis intestinalis truttae.* (*Studies on Octomitis intestinalis truttae.*) W. Schmidt. Arch. f. Protistenk., Jena, 1920, 40, 253–289.

Octomitis intestinalis (Dujardin) is a flagellate of the order Polymastigina, living in the intestines of batrachians and fish, and according to report also in turtles and lizards. It is a harmless commensal which aside from a temporary passage is not found in healthy trout. Infection is through food. The normal location is in the intestines but secondarily they may wander into the gall bladder.—W. A. R.

178. *Das Problem der Cyanophyzeenzelle.* (*The Problem of the Cell of the Cyanophyceae.*) O. Baumgärtel. Arch. f. Protistenk., Jena, 1920, 41, 50–148.

The protoplast of the Cyanophyceae is composed of two distinct parts, (a) the peripheral chromatoplasm, which contains the pigments; (b) the hyaline centroplasm. The centroplasm exhibits a vacuolate structure. In its alveoli are formed plastids which form the plastic substance within a stromatic capsule.

Every blue-green alga contains in its centroplasm the endoplasts, structures of a liquid to firm gelatinous consistency which represent a mixture of glyco- and P-proteids.

At the periphery of the endoplasts arise the epiplasts. They are composed of a very resistant shell of highly condensed nucleo-glyco-proteid and a less resistant kernel which shows more of a protein character.

The ectoplasts, composed mainly of protein substances are formed in the periphery of the entire centroplasm, when the formation of albumen exceeds the carbohydrate assimilation, as in minimal light, and in predominantly saprobiontic habits of life.

The hyaline centroplasm with its plastin apparatus represents an open cell nucleus, which unites with the nuclear functions also the rôle of carbohydrate plastids. This open nucleus with its double function the author designates as a caryoplast, a structure which phylogenetically represents the stage where the division of labor between the caryoplasm and the carbohydrate plastids is not yet complete.

The protoplast of the blue-green algae is therefore a slightly differentiated structure, whose peripheral portion is filled by the assimilation pigments not yet localized in the form of chromatophores. Without the medium of a centroplasm, the outer pigmented zone encloses the hyaline caryoplast. This organization thus represents a primitive type.—W. A. R.

179. Sphaerobactrum warduae, ein kettenbildender Ciliat. (*Sphaerobactrum warduae a Chain-forming Ciliate.*) W. J. SCHMIDT. Arch. f. Protistenk,. Jena., 1920, **40**, 230–252.

With rare exceptions the known chain-forming ciliates are parasitic and their peculiar method of reproduction has been regarded as an adaptation to parasitic life. *Sphaerobactrum warduae,* here described, was found free in plancton from small ponds at Bonn.

Most frequently the new protozoan appeared in the form of four equal sized spheres, arranged one after another, and moving rapidly as a whole through the water. The individual elements measured on the average 200 microns in diameter. Single spheres and doubles were much more rarely to be found.

The individual cells except at the point of union are uniformly covered with fine cilia, and lack cytostome, or similar structures, and contractile vacuoles. In the plasma are scattered zoochlorellae and in addition spherical groups of partially digested symbionts.—W. A. R.

180. Quasillagilis, ein neues Ciliatengenus aus dem Schwarzen Meer. (*Quasillagilis, a new Ciliate Genus from the Black Sea.*) W. BUSCH. Arch. f. Protistenk., Jena., 1920, **40**, 221–229.

Quasillagilis constanziensis nov. gen, et spec. is described as a holotrichous ciliate with flagellate affinities.—W. A. R.

181. Observations on Abnormal Courses of Infection of Paragonimus ringeri. SADAMU YOKOGAWA AND SUSUMU SUYEMORI. J. Parasitol., Urbana, Ill., 1920, **6**, 183–187.

While it is known that infection with *Paragonimus ringeri* is caused by swallowing the encysted larvae, the fact that such larvae can penetrate the intestinal wall, diaphragm, connective tissues muscles and other viscera raises the question as to whether they are capable of entering through the skin, mucous membrane or wound in the skin of the host.

Experiments on mice and puppies show that the young active larvae just freed from cysts cannot penetrate the sound skin but can enter through a fresh wound. Such distomes can infect the body *via* the mouth, in the usual manner.

They can penetrate the mucous membrane outside the digestive tract, like the conjunctiva, and bore through tissues until they reach the lungs. Distomes which have started development in the final host cannot infest other animals. If partly developed distomes are transferred to the orbits of a suitable host, they penetrate the tissues and reach the lungs.—W. A. R.

182. A Newly Discovered Parasitic Nematode. (*Tylenchus mahogani, n. sp.*) *Connected with a Disease of the Mahogany Tree.* N. A. COBB. J. Parasitol., Urbana, Ill., 1920, **6**, 188–191.

A minute nematode, females 0.56 mm. long, males 0.52 mm. living in the tissues of the mahogany tree. It resembles *Tylenchus musicola* Cobb, and *T. coffeae* Zimmerman. The seriousness of the disease caused is uncertain.—W. A. R.

183. Gereinigte Ciliatenzucht. (*Growing of Ciliates with Pure Cultures of Bacteria.*) R. OEHLER. Arch. f. Protistenk., Jena. 1920, **41**, 34–49.

Following successful attempts (Arch. f. Protistenk., 1916) at growing amebae, ciliates and flagellates in bacteria-free sterile cultures, the author now reports on growing ciliates in pure cultures of a single species of bacteria.

The experiments began with *Colpidium colpoda,* a single individual of which was confined in a slender glass tube until it had increased to a considerable number. This culture, with a dominant undetermined bacterium was then added to a pure culture of the hay bacillus. The water bacterium could not be crowded out by the hay bacillus, however abundant the latter was, but on addition of 1 to 2 per cent peptone solution the hay bacillus promptly gained the ascendancy and after two or three transfers the *Colpidium* was growing freely in pure culture of the bacillus. Inoculation of agar slants from these cultures produced pure cultures of the hay bacillus.

By making conditions unfavorable for the hay bacillus and favorable for a different species, various other bacteria crowded out the first mentioned and were tested. *Colpidium colpoda* was thus grown in pure culture of *Bacterium prodigiosum, B. coli, Bact. faecalis alcaligenes, Bact. pyocyaneus, Staphylococcus aureus, Sarcina lutea,* and *Spirillum volutans.* All such attempts having succeeded, Oehler thinks that any bacteria may serve as food for the *Colpidium colpoda.* On the other hand, it was unable to grow in pure cultures of the yeast, *Saccharomyces exiguus. Colpidium steini* and a cylindric *Colpidium* which may be a variety of *C. colpoda* grew freely in the yeast cultures.

Attempts to extend the experiments to *Paramaecium* (either *caudatum or aurelium*) were less successful. *Bact. fluorescens* quickly became the dominant species and all attempts to supplant it by other bacteria failed, because *Paramaecium* could not tolerate the solution rich in bacterial food.

A marked characteristic of the development of the tested ciliates in pure cultures of bacteria was their exact regularity of development. Moreover, in the one to three years that the various species were under observation conjugation was not once observed. Neither were there evidences of senility or variations in development.—W. A. R.

184. Zur Cystenbildung von Trichomonas muris. (*Cyst Formation in Trichomonas muris.*) M. Mayer. Arch. f. Protistenk., Jena., 190, **40**, 290–294.

Cysts of *Trichomonas muris*, as found in white mice are 12–14 microns in diameter, have a distinct cyst membrane and contain coiled about the nucleus an undulating membrane with well-developed marginal thread. The cyst wall readily dissolves when the stool is diluted with water or normal salt.—W. A. R.

185. Leucochloridium problematicum n. sp. T. B. Magath. J. Parasitol., Urbana, Ill., 1920, **6**, 105–113.

This striking larval trematode from sporocysts in the snails *Succinea retusa* and *Planorbis trivolvis* was found at Fairport, Iowa.—W. A. R.

186. On a new Mutillid Parasite of Glossina morsitans. R. E. Turner. Bull. Entomol. Research, Lond., 1920, **10**, 327–328.

Mutilla auxiliaris, the third mutillid to be bred from *Glossina* was bred from puparia of *G. morsitans* in Portuguese East Africa.—W. A. R.

187. Notes on the Life Cycle of Two Species of Acanthocephala from Fresh-water Fishes. H. J. Van Cleave. J. Parasitol., Urbana, Ill., 1920, **6**, 167–172.

Larvae of *Echinorhynchus coregoni* Linkins, have been found in the amphipod, *Pontoporea hoyi*. *Pontoporea* containing these larvae were taken from the stomach of white fish whose digestive tract was infested with this same parasite. Larvae of *E. thecatus* Linton have been found in *Hyalella knickerbockeri*. Young bass fed upon these amphipods acquired a general infestation of *E. thecatus*. Various fish likewise harbor encysted larvae of this worm in their viscera and in the peritoneum. An intermediate host does not seem essential. —W. A. R.

188. Papular Rashes in Children due to the Vermin peculiar to Starlings and other Birds. Med. J. Australia, Sydney, 1920, vol. 1, no. 10, 227.

All of the occupants of a house were more or less afflicted by the vermin which invaded the house. The vermin were traced to Starlings' nests under the eaves of the roof.—C. P. B.

189. Zur Wirkung einiger Phenole auf Würmer. (*The Effect of Certain Phenols upon Worms.*) Werner Schulemann. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1050–1052.

The anthelmintic effect of substances related to thymol was studied upon rain worms. The most effective were ortho and para benzylphenol and benzyl-o-cresol. Concentrations of 1:4,000 killed in 5 minutes and 1:32,000 in 24 hours. Benzyl alcohol is not effective at these dilutions. "Butolan" (p-benzyl phenolurethane) has been found clinically effective in oxyuriasis.—B. C.

190. The Flagellate Character and Reclassification of the Parasite Producing "Black-head" in Turkeys,—Histomonas (Gen. Nov.) Meleagridis (Smith). E. E. Tyzzer. J. Parasitol., Urbana, Ill., 1920, **6**, 124–131.

The extreme pleomorphism of the parasite of "blackhead" has led to much confusion regarding its nature. The author has demonstrated the constant presence in the parasite of an extranuclear body which takes part in nuclear division, and of a type of nuclear division commonly found in trichomonads. Rhythmic pulsating movements similar to that of trichomonads have been repeatedly observed. The assumption of ameba-like characters with respect to both movement and ingestion of solid particles, together with its ability to invade vertebrate tissues are thought to justify the creation of a new genus, *Histomonas*, for the parasite.—W. A. R.

TROPICAL DISEASES

(*See also Numbers 138, 303*)

191. Yellow Fever: Its Distribution and Control in 1920. W. C. Gorgas, H. R. Carter and T. C. Lyster. South. M. J., Birmingham, 1920, **13**, 873–880.

The authors discuss the methods of control of yellow fever under the following heads: (1) Prevention of introduction: (a) quarantine; (b) immunity by lowering stegomyia index. (2) Elimination: (a) fumigation; (b) isolation; (c) vaccines and serums; (d) anti-stegomyia measures. They believe that most beneficial results have been obtained from the use of an anti-yellow fever serum prepared by Noguchi. A vaccine has been used and, while not absolute in its protection, seems to be valuable.—J. H. B.

192. Responsibility of Physicians Who Treat Malaria Cases. C. C. BASS. South. M. J., Birmingham, 1920, **13**, 683–694.

The author insists upon the proper use of quinine which will not only cure but completely disinfect the patient.—J. H. B.

193. The Malaria Problem of the Rice Fields of the United States. J. C. GEIGER AND W. C. PURDY. South. M. J., Birmingham, 1920, **13**, 577–582.

Top-feeding minnows and oil-soaked sawdust are two control measures applicable to rice field conditions. The former has been shown conclusively in Louisiana; the cost of application of the latter may prove too great although it could be effectively used within flight distance of villages and towns.—J. H. B.

194. Le nuove ricerche scientifiche sul tifo esantematico. (The New Investigations on Exanthematic Typhus.) DOTT. ENRICO FERRARI. Sperimentale. Arch. di. biol., Firenze, 1919, **73**, 327–384.

A detailed, critical review of the work of recent years on typhus. The material is treated under the heading of: (1) Epidemiology and etiology; (2) pathological anatomy; (3) diagnosis by means of the Weil-Felix reaction; (4) specific treatment of dermo-typhus; (5) prophylaxis.

The review closes with a bibliography of nearly six hundred papers.—W. A. R.

MEDICAL ENTOMOLOGY

(See also Numbers 133, 273)

195. The Control of Breeding of Yellow Fever Mosquitoes in Ant-Guards, Flower Vases and Similar Containers. JAS. ZETEK. J. Econom. Entomol., Concord, N. H., 1920, **13**, 344–350.

The fact that *Stegomyia calopus* breeds readily in any small collections of water such as vases, ant-guards, fonts in churches, is well known. To empty out the water each day or so, and refill is not enough because the larvae cling tightly to the bottom. The use of oil or larvicide is offensive.

It is found that the use of about 2 grams or more of powdered para-dichlorobenzene, repeated every 7 days during the rainy season, or every 10 days during the dry season would prevent breeding in ant-guards, and in vases or similar receptacles, to which it need be added every 15 days, or each time the water is changed. For holy water urns, lump camphor is recommended.—W. A. R.

196. Mosquito Control in a Southern Army Camp. S. M. DOHANIAN. J. Econom. Entomol., Concord, N. H., 1920, **13**, 350–354.

A general discussion of mosquito control at Kelley Field, near San Antonio.—W. A. R.

197. The Mosquitoes of Far Eastern Ports, with Special Reference to the Prevalence of Stegomyia fasciata, F. A. T. STANTON. Bull. Entomol. Research, Lond., 1920, **10**, 333–344.

The danger of the introduction of yellow fever into Oriental countries is rendered greater by the increase in sea-borne traffic, and hence surveys of this type, taking account of the distribution and prevalence of the known carrier of the disease are of much importance.

It was found that in far eastern ports of the equatorial region *Stegomyia fasciata* is prevalent at all seasons of the year. Even where efforts have been made to reduce its numbers it is common; where no such efforts have been made, it is a veritable plague.

In ports situated towards the northerly limit of the eastern tropical belt the *Stegomyia* occurred in relatively small numbers in the colder months or was not met at all. It is thought probable that a survey of the ports of China and Japan would show that the conditions there are unfavorable for the propagation of *S. fasciata* even in the warmer months. If this supposition should prove correct, it would be shown that the path for the conveyance of yellow fever infection to the Orient is cut at this point.—W. A. R.

198. Delousing the Army in France. H. L. GILCHRIST. Mil. Surgeon, 1920, **47**, 129–148.

At the time the armistice was signed over 90 per cent of the troops of the A. E. F. were in a verminous condition. The work of delousing and thus avoiding the menace of typhus, was at this time turned over to the Chemical Warfare Service which was for this purpose transferred to the Quartermaster Corps.

In each division a thorough system of bathing and delousing was organized. In delousing men great care was exercised in disinfestation of their belongings at the same time.

Two general methods of disinfestation were followed: the mechanical method, and the chemical method.

Under the mechanical method the following equipment was used: Steam sterilizers (mobile and stationary); steam boxes; Serbian barrels; hot air disinfestors; Canadian hot air disinfestors; hot boxes; heated caves; flat irons; heated cans, etc.

Under the chemical method the following were used: Acetic acid, 10 per cent, or vinegar for head lice; alcohol, absolute or strong spirit, for head lice or crabs; benzine for head lice and body lice; benzol; camphorated alcohol—camphor one part in 90 per cent alcohol; camphorated oil; carbolic acid 2½ per cent followed by olive oil; cresol solution—5 per cent cresol soap solution killed nits and lice in 30 minutes—3 per cent killed in one hour; mercury for capitis, corporis and pubis; mercury-ammoniated white precipitate ointment; mercury and vinegar; mercury one to two thousand; napthaline 96 parts, cresol 2 parts and iodoform 1 part—known as N. C. I.

For the prevention of reinfestation, the following measures were adopted: (1) The detection of men who were infested; (2) the disinfestation of all clothing and bedding belonging to lice-infested men; (3) the cleaning of men by bathing; (4) cleaning of their billets or sleeping quarters.

During the 5 months during which records were kept, they showed a total throughout the divisions, Le Mans, and base ports, of 11,300,000 men bathed and 25,000,000 articles of clothing disinfested.

As a result of the experience gained in this work it is believed that the first step in combating lousiness is to teach the individual what lice are and to impress upon him the harm they can do. He should also be taught simple means by which they can be eliminated.

The seriousness of lousiness should be realized by all officers in command of troops and unremittent attention given by them in the examination of all members of their command, for without their personal supervision the work will not be accomplished.—W. A. R.

199. *Quelques Observations sur les Pediculides.* (*Observations on Pediculidae.*) N. Leon J. Parasitol., Urbana, Ill., 1920, **6**, 144–147.

Testing substances recommended by various writers the author found that oils of eucalyptus, clove, anise, spirits of turpentine, balsam of Peru, tincture of calamus, and powdered sulphur afforded no protection against body lice.

Hungry body lice may feed upon guinea pigs, white mice, dogs, cats, and rabbits. The attempts to feed them on frogs, chickens and pigeons, were wholly unsuccessful.

Impregnating the clothing with oils such as olive oil, petroleum, vaseline, or melted butter killed the embryos by gumming down the opercula of the eggs and also, after a time, killed adults by obstructing the spiracles.

The experiments of Galli-Valerio showing that young lice may be carried by the house-fly were repeated and confirmed.—W. A. R.

200. *A Gamasid Mite Annoying to Man.* H. E. Ewing. J. Parasitol., Urbana, Ill., 1920, **6**, 195–196.

The gamasid *Hyletastes missouriensis* Ewing is reported as causing annoyance in Virginia, near Washington, D. C., having been mistaken for "chiggers." When it attacks in great numbers, it is very irritating. No wheals or discolored spots are produced, hence it is easy to differentiate an attack of this mite from that of chiggers. The species has been collected also in Missouri and Illinois.—W. A. R.

201. *Investigations into the Bionomics of Glossina palpalis.* W. F. Fiske. Bull. Entomol. Research, Lond., 1920, **10**, 347–463.

These studies were begun in October, 1913, and extended over 2 years on the islands and shores of Victoria Nyanza. They had for their original objective the extermination of the tsetse fly as a sanitary pre-requisite to reclamation of territory from which inhabitants had been removed as a measure for stamping out sleeping sickness.

The results of an intensive survey of some ninety miles of lake shore led to the abandonment of the proposed practical scale demonstration of fly control, having shown that complete severance of contact between fly and population was unnecessary; since it was sufficient to reduce the density of fly to within moderate limits in populated districts or to reduce density of population to within moderate limits in fly-infested territory. The work is at present at a standstill pending a decision as to a future policy. In the meantime, the present paper presents a mass of unapplied data upon the bionomics of the fly.

When any considerable number of *Glossina palpalis* is caught the sexes are usually unevenly represented. This disparity is due primarily to the relative inactivity of the female flies and not as has always been assumed to the absence of the sex. The percentage of females in the catch was found to afford an index to the food supply, being low when their reptilian hosts were abundant.

The fly is several hundred times more likely to feed upon man where wild hosts are very few and female percentage very high than when they are very many and female percentage low. Thus this percentage is a very valuable index to the chances favoring transmission of human disease.

The active females habitually move along shore much faster than the males, or many of the males, which, stimulated by the sex instinct, loiter along the routes most freely, followed by the food hunting flies. Attractive shelter afforded a greatly increased percentage of male catch. This taken locally point by point along a reach of shore, the sex ratio becomes a subtle index to the attractiveness or repulsiveness of the local environment to the fly. Such data became of really great value in reaching conclusions concerning the relative attraction of various types of vegetation, etc.

Ordinarily the range of fly inland from the lake is extremely limited, disappearing at 300 to 500 yards, unless special cause exists. The dispersion may be forced, by hunger, or induced by superior attraction of environment, or both factors may act.

The study of hosts and host preferences showed that the crocodile and *Varanus* (monitor lizard) are the most favored hosts of *Glossina palpalis*. The situtunga (an antelope) and the pig come next and a considerable number of animals, including man, are fed upon when the flies are forced by hunger. As in the case of cattle, the relative susceptibility or immunity of man and of individual men to attack is very largely a question of temperament, and of conditions and circumstances, including the relative abundance of other food.

The larva of *Glossina* is nourished by the female until full-fed and ready to pupate and is then carried by her and deposited in protected situations.

Detailed investigations of the extent to which the species is dependent on breeding grounds of sorts easily found and recognizable as such were made in the hope that it would prove practicable to control the density of the insect by destruction of its specific breeding places.

The most attractive breeding grounds are the deposits of clean dry beach sand or gravel that occur more or less frequently along the shore. They must be in or near to the course followed by the streams of moving flies and they must be shaded. A second and very distinct type of breeding ground was discovered in fine dry vegetable debris, so dry and undecomposed as to be as unattractive to insects in general as is the sandy type. Fluctuations in the lake level were found to be a most important factor affecting breeding places. On large islands, at least, the fly requires in addition to food and shelter the protection provided for its pupae by sand or gravel deposits and by nothing else.

The flies absolutely require the shelter provided by arborescent or rankly-growing herbaceous vegetation, and the species could not exist in the absence of it. Two kinds are requisite, (a) light, such as serves as breeding grounds and for the active flies; and (b) massive, or forest-like, which is required by the inactive flies.

It is wholly impractical to consider any control measures involving artificial destruction of flies, and wholly necessary to rely on measures designed to deprive the insects of either food or protection, or to render food less available to them. Control through depriving the pest of its food is not only inadvisable, but dangerous. The fly would continue to exist if all favored hosts except cattle or pigs were removed. Moreover, where favored hosts are present man is almost immune to attack but when they are few, man is freely attacked.

It is on deprival of protection that chief reliance must be placed. The maximum of economy and efficiency is to be gained through clearing at precisely the right points, i.e, at the centers of infestation wherein natural increase of fly is most rapid.—W. A. R.

202. An Interesting Case of Milk Contamination. C. S. SPOONER. J. Econom. Entomol., Concord, N. H., 1920, **13**, 368–369.

Aphiochaeta scalaris, a Phorid fly was bred from larvae and pupae in a sample of milk. As the milk was still sweet when the adults emerged, it is doubtful if the flies had oviposited in the milk, though the larvae had subsisted on it. The case is of special interest since the larvae are known to cause myiasis of the intestine of man.—W. A. R.

203. Notes on some Culicidae Collected in Lower Mesopotamia. P. J. BARRAUD. Bull. Entomol. Research, Lond., 1920, **10**, 323–325.

Anopheles stephensi, Liston, appears to be the chief malaria carrier of the district. It bred continuously during the period of observation, October, 1918–February, 1919.

Eleven other species of mosquitoes are briefly noted.—W. A. R.

204. A Contribution to Knowledge of the Tabanidae of Palestine. E. E. AUSTEN. Bull. Entomol. Research, Lond., 1920, **10**, 277–321.

Until the present, knowledge of the dipterous fauna of Palestine has been practically *nil*. As a result of collections during the Palestine Campaign, 1917–1918, Austen records one species of *Chrysops*, and 16 species of *Tabanus*, and of these latter, 7, or the high percentage of 43.7, are described as new.—W. A. R.

205. On the Structure of Some Microsporidian Spores. R. KUDO. J. Parasitol., Urbana, Ill., 1920, **6**, 178–182.

There are at least two types of Microsporidian spores,—that represented by *Nosema bombycis* and that of *Thelohania magna*, a new species here described. The latter has a distinct polar capsule with spirally coiled polar filament, without central axis: it has a rounded sporoplasm containing a single nucleus. The parasite attacks the adipose tissue of the larvae of a mosquito, *Culex pipiens*.—W. A. R.

206. Gastrophilus Larven in der Haut des Menschen. (*Gastrophilus Larvae in the Human Skin.*) W. A. COLLIER. München. med. Wchnschr., 1920, **67**, 991.

A case is described in which gastrophilus larvae (Oestridae) were present in a neck wound. The characteristics of this case indicate that the horse, which is frequently infected with this fly, acquires stomach infection through the licking of the skin wounds and the subsequent swallowing of the larvae.—B. C.

PROTOZOÖLOGY

207. Protozoa of the Devil's Lake Complex. C. H. Edmondson. Tr. Am. Micr. Soc., Menasha, 1920, **39**, 167–198.

A detailed report of a study of the protozoa found in this region. In the concentrated water with high inorganic content the proportion of the number of species of the three groups of protozoa recognized in Devil's Lake corresponds favorably with the same in typical fresh water lakes. There was an apparent total absence of numerous forms found in fresh water. The subdivisions of the classes of protozoa are fairly well represented in Devil's Lake. Two new species are described in the report. Experiments indicated that the organisms of the lake may adjust themselves to fresh water conditions with more readiness than fresh water organisms can adapt themselves to the concentrated water of the lake.—J. H. B.

208. Serologische Untersuchungen an Kulturamöben. (Serological Studies on Non-parasitic Amebae.) W. V. Schuckmann. Berl. klin. Wchnschr., 1920, **57**, 545–547.

By means of serologic methods, the author appears able to differentiate between certain different species of amebae. This offers a possibility for the classification of those protozoa that are cultivable on artificial media.—B. C.

EPIDEMIOLOGY

(See also Numbers 120, 241)

209. Diphtheria Bacillus Carriers. Second Communication. C. G. Guthrie, J. Gelien and W. L. Moss. Johns Hopkins Hosp. Bull., 1920, **31**, 388–403.

The investigations reported were undertaken to determine how long *B. diphtheriae* persisted in the throats of persons having positive cultures but not suffering from clinical diphtheria, the toxicity or non-toxicity of these cultures, whether such organisms undergo a change of toxicity while growing in the throat of a carrier, whether any relation exists between their presence and pathological throat conditions other than clinical diphtheria, and by history and observation whether any of the carriers have previously had clinical diphtheria, any of them develop the disease, any of them have been exposed to a case or any person in contact with the carriers develops clinical diphtheria.—F. W. H.

210. Tonsillectomy as a Means of Treatment in Diphtheria Carriers. G. Brown and E. K. Hughes. Med. J. Australia, Sydney, 1920, vol. 1, no. 16, 361–365.

Attention is drawn to the large number of cases occurring in Brisbane, one school of 800 had 12.5 per cent carriers. Over 100 tonsillectomies were done in 1919 upon persistent carriers. The average time for 3 negative cultures was about 12 days, and they conclude this series is sufficient warrant for enucleation of tonsils and thorough removal of adenoids in cases of persistent carriers of diphtheria bacilli.—C. P. B.

211. The Effect of Diphtheria Antitoxin in Preventing Lodgment and Growth of the Diphtheria Bacillus in the Nasal Passage of Animals. J. Gelien, W. L. Moss and C. G. Guthrie. Johns Hopkins Hosp. Bull., Balt., 1920, **31**, 381.

Experiments on cats, guinea pigs and rabbits show that subcutaneous inoculation of antitoxin does not prevent the subsequent lodgment and growth of *B. diphtheriae* in the nasal passages.—F. W. H.

212. Milk-Borne Diphtheria. Jonathan E. Henry. J. Am. M. Ass., Chicago, 1920, **75**, 1715.

The outbreak occurred in Williamstown, Mass. Twenty-four cases were traced to an infected milk supply and a few weeks later 14 cases were observed. The latter were ascribed to an infected teat which showed the presence of diphtheria bacilli and the owner of the dairy had the infection in a sore on his hand.—P. G. H.

213. Zur Epidemiologie der durch Paratyphus B-Bacterium verursachten Erkrankungen in Schleswig-Holstein. (On the Epidemiology of the Disease in Schleswig-Holstein Caused by Paratyphoid B Bacteria.) Ludwig Bitter. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt., Orig., 1920, **85**, 110–120.

Cases of fever caused by typhoid and paratyphoid B bacilli in Schleswig-Holstein are discussed together with their relationship to war conditions. The article is essentially epidemiological.—R. E. B.

214. Relation of Raw Water to Endemic Typhoid Fever. N. J. Howard. Mun. Eng. San. Rec., (England) 1920; Can. Engr., 1921, **40**, 139–141; Pub. Works, 1920, **49**, 567–569.

After discussing the reduction of typhoid in municipalities where water purification and sterilization plants are installed, the writer points out the failure to isolate typhoid in raw water in Houston's experiments in England. The conditions at Toronto are then noted in detail, showing the reduction in typhoid fever death rate of 40.8 in 1910 to 2.0 in 1920. The seasonal prevalence of *B. coli* is shown to have a relation to the typhoid, the highest *B. coli* occurring in July, August and September, the number of typhoid cases also occurring then. General improvement in sanitary conditions has also helped.—L. P.

PUBLIC HEALTH REGULATION

(*See Numbers 150, 151*)

DISINFECTION AND GROWTH INHIBITION

(*See also Numbers 84, 131, 189*)

215. *Variations in the Resistance of Protozoan Organisms to Toxic Agents.* R. A. Peters. J. Physiol., 1920, **54**, 260.

The ciliate protozoan *Colpidium* was studied by adding varying amounts of a neutral solution of mercuric chlorid and determining the numbers of organisms remaining alive after varying periods. The results were found to agree fairly well with those secured in the study of disinfection of cultures of bacteria by various disinfectants. It was found that these organisms die in such a way that there is approximately a straight line relationship between the time and the logarithm of the percentage of survivors during a large part of the death process. By an analysis of the death process, he concluded that this apparent logarithmic law can be interpreted in terms of the variation in the resistance of the individuals to the toxic agent.—R. E. B. |

216. *Die entwicklungshemmende Wirkung von Kupfersalzen auf Krankheit erregende Bakterien.* (*The Growth Inhibiting Action of Copper Salts on Disease-producing Bacteria.*) v. Linden. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt., Orig., 1920, **85**, 136–166.

In a study of the effect of copper upon several species of pathogenic bacteria and on some nonpathogenic forms, it was found that their susceptibility varied greatly. In general, the destructive action of a given amount of copper was much greater when dissolved in water than in fluids such as broth containing protein, or in solid media containing protein. The tubercle bacillus was an exception in that even inorganic media growth was entirely inhibited by a concentration of 1:1,000,000 of copper. It was also observed that when the tubercle bacillus was grown in a medium to which copper was added, the organisms took up the copper in amounts sufficient to color them. In a few hours a solution of copper would color tubercle bacilli a grass green. On solid media the organisms became first greenish and then brown. The organism is so very sensitive to copper that it will not ordinarily grow in tubes which have previously been used for copper medium.

In general, cocci secured from the air and water and including such organisms as *Staphylococcus aureus* are most resistant. *Vibrio Finkleri* is also relatively resistant. The organisms of the paratyphoid and dysentery group are intermediate while the *Vibrio cholerae* and the *Bacterium typhi* are quite susceptible, although not so sensitive as the tubercle bacillus. Various organic compounds of copper as well as inorganic compounds were studied. Of particular interest was the author's success in immunizing mice to lethal doses of *Bacterium paratyphi B* by the feeding of organic copper compounds.—R. E. B.

217. *Desinfektion bei künstlich erniedrigtem Kochpunkte unter Anwendung flüssiger Desinfisientia.* (*Disinfection with Artificially Depressed Boiling Point by Use of Liquid Disinfectants.*) C. S. Stokvis. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt., Orig., 1920, **85**, 166–176.

Apparatus is figured for exposing organisms to a stream of steam at different reduced pressures. Various liquid disinfectants were added to the boiling water from which the steam was derived. The disinfectants tested were formaldehyde, thymol, turpentine and phenol. The only disinfectant found to be of significance in bringing about the destruction of microorganisms in a short period of time was formaldehyde.—R. E. B.

FOOD BACTERIOLOGY

218. *Bacterial Decomposition of Salmon.* Albert C. Hunter. J. Bact., Balt., 1920, **5**, 353–361.

Examination of salmon immediately or shortly after being trapped and after storage at room temperature (50° F.–70° F.) indicated that the muscular tissue of freshly caught salmon is sterile. After storage the bacterial count of the tissue may rise as high as 155,000,000 per gram. Thorough washing of the fresh fish results in a lower bacterial count and an increase in the length of time before putrefaction sets in. When there is no food present in the digestive tract (as in the spawning migration) the tract is sterile. The blood vessels appear to be the channels through which infection is spread from the skin to the internal organs and to the musculatures. *Bact. coli* was not found in the digestive tract. "Salmon out of water more than 48 hours at temperatures between 50° F. and 70° F. are decomposed to such an extent that they are not desirable as food."—I. S. F.

219. *Diseases of Apples in Storage.* Charles Brooks, J. S. Cooley and D. F. Fisher. U. S. Dept. Agric., Farmers Bull., 1160, 1920.

The bulletin discusses various diseases of apples in storage in such a manner that they may be readily recognized. It was found that delay in warm packing sheds or cars shortens the natural life of apples and greatly increases their tendency to rots and scalds. Apple rots are slow to start at a temperature of 32° F., but if a beginning has been made at higher temperatures they can proceed more rapidly. Ventilation is as important as low temperature in preventing scald. Wrapping apples in oiled wrappers furnishes the most complete protection against scald.—S. H. A.

220. *Bacteriologische, onderzoekingen over zoogenaamde. Yoghurtplantjes en Kefirkorrels.* (*Bacteriologic Examinations of So-called Yoghurt Plants and Kefir Granules.*) J. Boersma. Med. v. d. Rijksseruminrichting, Rotterdam, 1918, **1**, 344–373.

A description of the yoghurt plants and kefir granules followed by a review of the literature pertaining to the subject and a report of the author's own investigations. The latter lead to the following conclusions: (1) The so-called yoghurt plants are genuine kefir granules; (2) the kefir granules are formed by *Lacto-bacillus caucasicus B.* The yeast cells occur on and within the same because they find there a protecting location, but they do not contribute to the structure of the granule; (3) all other organisms formed in kefir granules must be regarded as accidental contaminations; (4) Beijerinck is so far the only one, who has examined kefir granules thoroughly.—L. V. E.

221. *Nieuwe Denkheelden omtrent den Samenhang van Ziekten bij Slachtdieren en Vleeschvergiftingen bij den Mensch.* (*New Ideas Concerning the Relation of Diseases among Market Meat and Meat-poisoning in Man.*) C. F. Van Oyen. Tijdschr. v. Diergeneesk., Utrecht, 1919, **46**, 285–299.

A discussion which the author summarizes as follows: There are kinds of meat poisoning in man which are caused by the consumption of meat of animals which were suffering from paratyphoid B or enteritidis infection. We are not in a position to recognize such animals clinically or by autopsy. The agglutination test with meat extract enables us to demonstrate with certainty within a short time a part of these cases. Nearly all other cases can be shown by feeding experiments or by bacteriologic examination although it must be admitted that the period after which the results of such an investigation can be known is sometimes too long for practical purposes. For the proper development of meat inspection it is necessary that a serodiagnostic method be discovered by which the intoxications or infections mentioned can be demonstrated within a short time and with certainty.—L. V. E.

HEALTH BOARD LABORATORY METHODS

222. *A Rapid Cultural Method of Diagnosing Diphtheria.* W. D. Frost, Alice M. Charlton and Mary F. Little. J. Am. M. Ass., Chicago, 1921, **76**, 30.

The paper shows the possibilities of using the Frost "little plate" method for early demonstration of the presence of diphtheria bacilli. The infected swab is smeared over a sterile glass slide, addition of a small amount of culture medium and incubation for 5 hours. A medium consisting of agar, milk and serum is used. The young colonies show the forms of individual cells and their relation to one another. The 5-hour diphtheria colony shows the single cells in the usual characteristic form. They are usually clubbed and take the stain unevenly. They occur in parallel and angular arrangement. The authors are convinced that a diagnosis can be made with as much certainty as with the usual method and in from one-third to one-half the time.—P. G. H.

223. *The Diagnosis of Anthrax from Putrefying Animal Tissues.* W. A. Hagan. J. Bact., Balt., 1920, **5**, 343–351.

In the examination of animal tissues for *B. anthracis* little difficulty is encountered from contaminating organisms if the material is fresh. If it has been permitted to putrefy the identification of the anthrax bacillus is considerably more difficult because many anthrax-like organisms (largely anaerobes) are met with. The author has found that examination of "anthrax-like colonies" from smears made upon agar plates directly from the suspected material offers the best method for the rapid diagnosis of anthrax. The guinea pig inoculation method often fails because contaminating organisms frequently cause death by malignant edema before anthrax bacilli which may be present have had time to develop. Anthrax colonies can be distinguished from anthrax-like colonies with no great difficulty and the diagnosis made rapidly.—I. S. F.

224. *Further Observations on the Eosin-Methylene Blue Agar.* Max Levine. Iowa Section, Am. W. W. Assn., 1920; Eng. Contig., 1921, **55**, 47.

The method suggested is intended to differentiate between *B. coli* and *B. aerogenes.* The medium consists of 1 per cent peptone, 0.2 per cent dipotassium phosphate, 1.5 per cent agar, 1 per cent lactose and eosin and methylene blue as indicators. The method of preparation of the medium and the criteria for observation are detailed.—L. P.

225. *Apparatus for Staining and Drying Slides.* Frederick H. Lamb. J. Lab. & Clin. M., St. Louis, 1920, **6**, 101–102.

Lamb describes an apparatus that he has found particularly useful in staining tubercle bacilli.—F. W. H.

226. *Untersuchungen über die praktische Verwendbarkeit der Anreicherungsmethode mittels Antiformin zum Nachweis von Tuberkelbazillen im Sputum.* (*Studies on the Practical Utilization of Enrichment Methods by Means of Antiformin for the Recognition of Tubercle Bacilli in Sputum.*) Gerhard Voigt. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **85**, 121–125.

It is concluded that the modification of the Uhlenhuth method of enrichment of tubercle bacilli as modified by Hundeshagen is admirably adapted for the recognition of tubercle bacilli in sputum.—R. E. B.

DIATHETIC AND DEFICIENCY DISEASES

227. *Pollens in Their Relation to Hay-Fever.* W. Scheppegrell. N. Orl. M. & S. J., 1920, **72**, 618–663.

The idea that golden rod, daisies, lilies of the valley and similar plants are responsible for hay fever is erroneous. The majority of hay fever pollens are generated by worthless weeds. Since the only pollens which can cause hay fever are those which are carried by the wind, hay fever plants are characterized by being wind pollinated, very numerous, and with inconspicuous flowers, without bright colors or scent.

All plants having the above qualities are suspicious from a hay fever standpoint. If a small amount of their pollen is applied to the nostril or angle of the eye of a susceptible subject, and produces a hay fever reaction the plant is added to the hay fever list. This reaction must be capable of being produced not only during the hay fever season but at any time of year.

From a biological standpoint most of the hay fever pollens may be reduced to the four groups: (1) *Gramineae* (grasses); (2) *Ambrosias* (ragweeds); (3) *Chenopodiaceae,* (chenopods); and (4) *Artemisias* (wormwoods).

In treatment, the lack of knowledge regarding the specific pollens responsible for cases of hay fever results in erratic efforts. By using extracts of each of the above four groups most cases of the disease in the United States may be treated by immunizing methods.—W. A. R.

CANCER RESEARCH

(*See also Number* ***220***)

228. *Über Knorpel-und Knochengeschwülste der Muskulatur.* (*Cartilage and Bone Tumors of the Musculature.*) F. Landois. Virchow's Arch. f. path. Anat. (etc.), Berl., 1920, **229**, 101.

The author discusses cases of true cartilage and bone tumors; cases of spindle cell sarcoma and angioma containing bone, and myositis ossificans.—S. A. G.

DISEASES OF THE BLOOD, LYMPHATICS AND DUCTLESS GLANDS

229. *Lymphosarcoma, Lymphatic Leukaemia, Leukosarcoma and Hodgkin's Disease.* L. T. Webster. Johns Hopkins Hosp. Bull., Balt., 1920, **31**, 458–460.

In this article Webster summarizes a study of 123 cases of lymphosarcoma, lymphatic leukemia, leukosarcoma and Hodgkins' disease. The author thinks it not unlikely that lymphosarcoma, leukosarcoma and lymphatic leukemia are different manifestations of the same disease and believes the term "lymphadenosis, leukaemic or aleukaemic" would simplify the classification until the causative factor is found. Webster also believes the disease is not a neoplasm but a lymphatic response to a chemotactic influence exerted by the etiologic agent, the presence of which in any tissue or organ leads to an accumulation there of lymphoid cells. The diagnosis and prognosis of the disease in its early stage by the microscopic examination of a single gland is difficult since it resembles certain types of benign adenitis. When ameboid activity on the part of the lymphocytes is noted it is indicative of a rapid fatal course. Hodgkin's disease can be readily diagnosed microscopically and is probably a distinct entity.—F. W. H.

230. *Studies on Compensatory Hypertrophy of the Thyroid Gland.* Leo Loeb. J. Med. Research, Bost., 1920, **42**, 77–89.

Experiments are reported in which the effect on compensatory hypertrophy of feeding thyroid gland and thymus was tested. The effect of the subcutaneous injection of tethelin was also studied. Guinea pigs were the experimental animals.

In contradistinction to iodine, feeding with thyroid tablets had a very marked inhibiting effect on compensatory hypertrophy of the thyroid gland. This effect was direct and specific. Iodine preparations given simultaneously with thyroid preparations did not counteract the effect of thyroid.

Feeding with thymus did not prevent thyroid hypertrophy. Repeated injection of tethelin did not noticeably influence the degree of thyroid hypertrophy which follows extirpation of the greater part of the thyroid gland.

A diet consisting principally but not exclusively of meat given to guinea pigs during a period of three and one-half weeks does not produce hypertrophic changes in the thyroid gland; such a meat diet does neither prevent nor (according to our preliminary experiments) noticeably increase compensatory hypertrophy of the thyroid gland in the guinea pig.—A. C. E.

DISEASES OF THE CIRCULATORY SYSTEM

(*See also Number 239*)

231. *Pneumococcus Type I Vegetative Endocarditis. Report of a Case Following an Attack of Lobar Pneumonia.* HENRY M. THOMAS, JR. AND DWIGHT O'HARA. Johns Hopkins Hosp. Bull., 1920, **31**, 417–419.

The authors, after reporting a case of Type I pneumococcus vegetative endocarditis and reviewing the literature, state there is some cause to believe from the reports of a small group of cases and from the tendency of Type I pneumococcus to produce secondary infections and septicemia that pneumococcus endocarditis is usually caused by Type I pneumococcus.—F. W. H.

232. *Arterienarrosion durch Soorpilze mit tödlichen Blutungen, ein Beitrag zur Kenntnis der Oidiomykosen.* (*Arterial Erosion by Thrush Fungus with Fatal Hemorrhages. A Study in Oidiomycology.*) L. PICK. . Berl. klin. Wchnschr., 1920, **57**, 798–802.

The pathological features of a case are discussed in detail. Circumscribed suppurative areas were found in the larger arteries. These led to erosions and subsequent fatal internal hemorrhage.—B. C.

233. *Congenital Aneurysm of the Aortic Sinus of Valsalva.* CARL GOEHRING. J. Med. Research, Bost., 1920, **42**, 49–59.

Report of a case of congenital aneurysm of the aortic sinus of Valsalva is given in detail, and 6 cases reported by other observers are summarized. All 7 cases present a similar history and physical findings. The various causes which have been offered for the development of these aneurysms are discussed.—A. C. E.

DISEASES OF THE DIGESTIVE SYSTEM

(*See also Numbers 91, 102, 213, 247, 295, 306*)

234. *Ueber den Verlauf einer Typhus- und Paratyphusepidemie in Rumänien.* (*A Typhoid and Paratyphoid Epidemic in Roumania.*) GEORG WOLFF. Berl. klin. Wchnschr., 1920, **57**, 754–757.

From July to December, 1917, there occurred a typhoid and paratyphoid A and B epidemic among the German troops in Roumania. There were 101 cases of typhoid, 267 of paratyphoid A and 285 of paratyphoid B, all confirmed by bacteriological and serological examinations. These figures indicate the effectiveness of antityphoid vaccination, which, however, did not protect against the paratyphoid infections.—B. C.

235. *Solitary Amebic Abscess of the Liver.* WILLIAM J. MALLORY. J. Am. M. Ass., Chicago, 1920, **75**, 1774.

Amebic dysentery accompanied by amebic abscess of the liver may occur in persons who have never been in tropical or subtropical regions. Such abscesses may occur years after an attack of amebic dysentery. Amebic abscess of the liver may be the cause of so-called obscure fevers.—P. G. H.

236. *Ueber Appendikostomie bei chronischer Ruhr.* (*Appendicostomy in Chronic Dysentery.*) FRIEDRICH NIKLAS. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1026–1028.

Any case of chronic dysentery which, after 8 to 10 weeks of intensive treatment, continues to show pus and blood in the stools should be appendicostomized and systematically lavaged. This treatment offers hope if undertaken while the patient is still to a certain degree reactive.—B. C.

237. *Bemerkungen zur Pathologie der akuten Leberatrophie.* (*The Pathology of Acute Atrophy of the Liver.*) L. RIESS. Berl. klin. Wchnschr., 1920, **57**, 537–540.

This disease is said to be more prevalent now in Germany and is ascribed in part to an impoverished nutrition. Because of the occurrence of liver atrophy due to syphilis, and of the clinical similarity between liver atrophy and Weil's disease, it is suggested that future bacteriological research may reveal the acute atrophy to be due to a new form of spirillosis. —B. C.

238. *Klinische Beobachtungen zur Pankreaspathologie.* (*Clinical Observations on the Pathology of the Pancreas.*) OSKAR GROSS. Virchow's Arch. f. path. Anat. (etc.), Berl., 1920, **229**, 90.

The author describes cases of mumps, syphilis, and chronic pancreatitis with pancreatic lithiasis.—S. A. G.

DISEASES OF THE GENITO-URINARY SYSTEM

(*See also Numbers 147, 271*)

239. Malignant Endocarditis and Metastatic Abscess in Gonococcemia. Hugh L. Dwyer. J. Am. M. Ass., Chicago, 1920, **75**, 1643.

The author thinks that on account of the difficulty in cultivating the gonococcus its apparent absence does not justify the exclusion of cases of endocarditis from gonococcal infections. The gonococcus may be but a transient inhabitant of the blood stream, and blood cultures would therefore often be negative. Endocarditis is common in childhood and occurs frequently as a complication of rheumatism and chorea. Gonococcic endocarditis is rare.—P. G. H.

240. Syphilis as a Problem in Group Diagnosis. Albert Keidel and J. E. Moore. South. M. J., Birmingham, 1920, **13**, 857–861.

A report of 4 cases illustrative of the methods employed in the Syphilis Department of the Johns Hopkins Hospital.—J. H. B.

241. An Experimental Study of the Latent Syphilitic as a Carrier. Frederick Eberson and Martin F. Engman. J. Am. M. Ass., Chicago, 1921, **76**, 160.

Spirocheta pallida was isolated from latent syphilitics, three times from inguinal glands and twice from semen. Typical lesions were produced in the testicles of rabbits from the strains. The incubation period of the strains isolated from the glands was 54 and 133 days, respectively. *Spirocheta pallida* was isolated from patients who gave a history of syphilis dating back 11 and 13 years in 2 instances and one year in 3 instances. In one case a gland was found to be infectious while the Wassermann test was negative. Virulence of the organism was not lost as far as the studies have gone. The blood and other fluids excepting semen appear not to be infectious in latent syphilitis. Persons giving a history of old syphilitic infection may harbor virulent spirochetes in spite of irregular Wassermann reactions or slight reactions in the cholesterin antigen.—P. G. H.

242. "Aszendierende" oder "deszendierende" ausbreitung der männlichen Genitaltuberkulose? (Ascending or Descending Spread of Male Genital Tuberculosis?) G. Praetorius. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1081–1082.

Polemical against Kraemer (Abstr. Bact., 1920, **4**, 1786). Praetorius prefers "testifugal" and "testipetal" as descriptive terms.—B. C.

DISEASES OF THE NERVOUS SYSTEM

(*See also Number 310*)

243. The Treatment of Neurosyphilis by the Intraspinal Route.—With the Report of a Clinical Study of a Series of Cases Treated from the Point of View of Increased Permeability of the Meninges. Albert Keidel and J. E. Moore. Johns Hopkins Hosp. Bull., 1920, **31**, 404–410.

Keidel and Moore conclude that intraspinal therapy is a necessity in cases of neurosyphilis which do not respond to routine antisyphilitic treatment, that intraspinal medication does not depend upon increased meningeal permeability for its action and that aseptic meningitis caused by intraspinal inoculation may prove an untoward factor in the treatment of neurosyphilis.—F. W. H.

244. Family Outbreaks of Epidemic Poliomyelitis. F. W. Mulsow and William J. Matousek. J. Am. M. Ass., Chicago, 1921, **76**, 159.

An instance of 4 cases of poliomyelitis occurring in one family. It appeared that 2 cases appeared simultaneously, first two girls and later two boys. It was not possible to determine whether all 4 cases had a common source of infection.—P. G. H.

DISEASES OF THE RESPIRATORY SYSTEM

(Except Influenza and Tuberculosis)

(*See also Numbers 231, 307*)

245. Pleural Spirochaetosis. V. R. Mason. Johns Hopkins Hosp. Bull., Balt., 1920, **31**, 435–438.

Mason reports a case of infection of the pleural cavity with *Spirocheta bronchialis* and reviews the literature of spirochetal infection of the lung.—F. W. H.

246. An Experimental Study of the Mononuclear Phagocytes of the Lung. H. H. Permar. J. Med. Research, Bost., 1920, **42**, 9–32.

This study was limited to the reactions found in the lungs of experimental animals following the intratracheal injection of foreign particulate matter. "Vital" staining was also used to mark the large mononuclear wandering cells. The staining was accomplished by repeated intravenous injections of isamine blue. The materials used for intratracheal injection consisted of heavy and light suspensions of carmine powder in physiological salt solution, injected in such a manner as to get a good distribution of the injected material throughout the lung with fair quantities reaching the air sacs.

To sum up the findings in the lung in vitally stained but otherwise normal animals, the author states that "it would appear that there is a succession of endothelial cells proliferated from the capillary linings which wander into the alveoli. . . . . These cells are demonstrated in the experimental animal not only as morphologically identical with the dust phagocytes of the alveoli, but also to actually serve as dust phagocytes in the alveoli."

From their field of activity in the air sacs, these phagocytes were found slowly returning to the interstitial tissues of the lung with their loads of carmine, wandering very gradually into the terminal lymphatics, and so along these channels to their eventual goal, the peribronchial lymph node.

The alveolar lining cells failed to show any evidence of vital stain after the intravenous injections. Also if a small quantity of the solution of dye was injected intratracheally, all of the dust cells of the alveoli readily took it up, while none of the alveolar lining cells showed even a trace of the blue color. There was no evidence whatever that the alveolar epithelial cells *in situ* could ingest the carmine particles.

The phagocytes demonstrated clearly their faculty of ameboid movement, particularly in their mode of entering and leaving the alveoli.—A. C. E.

247. *Verblutungen in den Magen bei Lungenentzündung.* (*Gastric Hemorrhages in Pneumonia.*) LADISLAUS V. FRIEDRICH. Berl. klin. Wchnschr., 1920, **57**, 898–899.

A case is described in which gastric erosions were found in conjunction with lobar pneumonia.—B. C.

INFLUENZA

248. *Influenzabazillen und Influenza.* (*Influenza Bacilli and Influenza.*) E. SELIGMANN AND GEORG WOLFF. Berl. klin. Wchnschr., 1920, **57**, 677–679; 709–712.

Epidemiological data as well as biological research indicate that Pfeiffer's influenza bacillus can not be the etiologic agent of pandemic influenza. It is rather a companion of the influenza virus and indeed does not occur more frequently in influenza than in measles or whooping-cough. It merely happens to find a favorable environment in these diseases which are characterized by destruction in the bronchial system. The rôle of the influenza bacillus in influenza is analogous to that of the streptococcus in scarlet fever or of the hog cholera bacillus in hog cholera. A special name is needed to characterize this group of organisms which regularly accompany a specific disease. "Nosakoluth bacteria" (from νόσος = disease and ἀχολουθέω = I accompany) is the name suggested. Influenza bacilli are asserted to be "nosakoluths" of influenza, whooping-cough and measles.—B. C.

249. *Zur Aetiologie der Influenza.* (*On the Etiology of Influenza.*) FELIX E. R. LOEWENHARDT. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt., Orig., 1920, **85**, 82–95.

After a review of the literature of the pandemic of influenza and a discussion of the incidence of the influenza bacillus in cases of disease, the author comes to the conclusion that the etiologic significance of the influenza bacillus in accordance with teachings of Richard Pfeiffer has been established.—R. E. B.

250. *Das Vorkommen der Pfeifferschen Influenzabazillen und ihre Eigenschaften.* (*The Occurrence of Pfeiffer's Influenza Bacillus and Its Properties.*) TH. MESSERSCHMIDT. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1023–1024.

A search was made for Pfeiffer's influenza bacillus in the secretions and excretions of healthy and sick men and animals. Aside from those with influenza, the bacillus was found in tuberculous sputums and in the prostate secretions of a few suffering from prostatitis. An acid-, alcohol- or alkali-fastness was not demonstrated for the influenza bacillus.—B. C.

251. *A Report of an Epidemic of Influenza in an Army Post of the American Expeditionary Forces in France.* ALAN M. CHESNEY AND FRANK W. SNOW. J. Lab. & Clin. M., St. Louis, 1920, **6**, 78–95.

The study of this epidemic brought forth strong evidence that the virulence of the virus of influenza is increased by successive passage through human hosts.—F. W. H.

252. *Lähmungen nach Grippe.* (*Sequelae of Influenza.*) ERICH LESCHKE. Berl. klin. Wchnschr., 1920, **57**, 514–516.

Damages to the central nervous system are discussed and described, the types being (1) encephalitis lethargica; (2) encephalitis choreatica; (3) encephalitis apoplectica; and (4) encephalitis neuralgica. The etiological agent of these encephalitic forms is considered to be the filterable virus of Straus, Hirschfeld and Loewe.—B. C.

253. Influenza und Lungentuberkulose. Klinische, pathologisch-anatomische und biologische Erfahrungen. (Influenza and Pulmonary Tuberculosis. Clinical, pathologic-anatomical and Biological Experience.) H. MUCH AND H. ULRICI. Berl. klin. Wchnschr., 1920, **57**, 488–491.

The view of numerous recent writers that tuberculosis is not unfavorably affected by influenza is distinctly erroneous. Latent pulmonary tuberculosis is fanned to flame out as caseous pneumonia and tuberculosis of the galloping type after an attack of influenza. This is clearly brought out in the clinical experience of Ulrici. Much with his technic of studying immunity processes by means of partial antigens confirms this finding in individuals whose immunity picture he knew before influenza attacked them. Thus, in 45 per cent of them there was a total disappearance of reactive power toward all tubercle partigens; in 40 per cent there was a diminution or extinction of reactive power toward a single partigen, and in only 15 per cent was the reactive power unaffected. (The number of cases upon which the above is based is not given.) Since immunity reactions are merely indicators of body defense and only indirectly and imperfectly of the intensity of invasion, it is not possible from the above findings to say definitely that those in whom all reactive power was lost would succumb to tuberculosis. On the other hand it is clear that such persons undoubtedly offer a more unresisting target for the invasion if such should occur.—B. C.

254. Hautemphysem und Stenose bei Grippe. (Skin Emphysema and Stenosis in Influenza.) JOSEPH GEHRT. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1052–1053.

Four fatal cases are described in which the unusual symptom of skin emphysema followed influenza. Post mortem examination revealed the pathological and mechanical conditions responsible. In addition to respiratory difficulty, two other causes are suggested: (1) a constitutional connective tissue weakness, and (2) bacterial damage to the pulmonary alveoli.—B. C.

255. Beitrag zur Grippebehandlung, besonders über die Verwendung des Strychninum nitricum gegen die Kreislaufschwäche. (Influenza Treatment, Especially the Use of Strychnine Nitrate against Circulatory Failure.) GEORG EISNER. Berl. klin. Wchnschr., 1920, **57**, 517–520.

Results in 140 cases are reported. Specific therapy with eucupin and influenza serum often was favorable. It is believed that their use is not altogether without value.—B. C.

256. Ueber Grippebehandlung. (Influenza Treatment.) DÖRRENBERG. Berl. klin. Wchnschr., 1920, **57**, 516–517.

The symptomatic and general treatment depends largely upon whether the disease first attacks the respiratory or the alimentary system.—B. C.

ENCEPHALITIS LETHARGICA

257. Zur pathologischen Anatomie der herrschenden Encephalitis epidemica. (The Pathological Anatomy of the Prevailing Epidemic Encephalitis.) H. SIEGMUND. Berl. klin. Wchnschr., 1920, **57**, 509–511.

The characteristic of the current epidemic is not in important anatomic differences from inflammations of the brain substance of other etiology, but only in the peculiarly constant localization of the changes to the gray matter around the central fissure at the base of the third and fourth ventricles and around the aqueduct of Sylvius.—B. C.

258. Ueber Encephalitis lethargica mit besonderer Berücksichtigung ihrer chronischen Verlaufsform. (Lethargic Encephalitis, with Especial Reference to Its Chronic Form.) C. MOEWES. Berl. klin. Wchnschr., 1920, **57**, 512–513.

So-called epidemic lethargic encephalitis is believed to have no definite relation to influenza-cephalitis. The former is characterized by a definite symptom-complex in which somnolence and oculo-motor symptoms are outstanding features; and in non-fatal cases it shows a tendency to chronicity. Typical cases are briefly described.—B. C.

259. Bakteriologischer Befund bei der Leichenuntersuchung eines Falles von Encephalitis lethargica. (Post mortem Bacteriological Finding in a Case of Lethargic Encephalitis.) P. MANTEUFEL. Berl. klin. Wchnschr., 1920, **57**, 926.

The secretion of the air passages yielded pure cultures of numerous influenza bacilli. Demonstration of a filterable virus or of Hilgermann's bodies was unsuccessful. It is still an open question whether the encephalitis is to be regarded as a toxic effect of the influenza bacilli or whether the latter are a concurrent finding.—B. C.

TUBERCULOSIS

(*See also Numbers 90, 225, 242, 253*)

260. *Studies on the Relation of Mineral Dusts to Tuberculosis. 1. The Relatively Early Lesions in Experimental Pneumokoniosis Produced by Granite Inhalation and Their Influence on Pulmonary Tuberculosis.* LeRoy U. Gardner. Am. Rev. Tuberc., Balt., 1920, **4**, 734–755.

Guinea pigs were infected with a strain of tubercle bacillus which had been grown on artificial media for 29 years and which, when inhaled by them would produce lesions that readily healed. The animals, with normal controls, were subjected to granite dust from Barre, Vermont for periods of 6 to 8 hours daily continuing from 2 to 7 months. The author studied the changes brought about by dust alone, by tubercle bacilli alone and by the combined action of the two. He concludes:

"1. That the occurrence of tubercles is more frequent in the dusted than the undusted lung.

"2. That such lesions tend to run a more prolonged course than those in animals not exposed to dust.

"3. That the spread of the tuberculous process to the regional lymph nodes is not prevented."—T. G. H.

261. *An Attempt to Produce Experimental Tuberculous Pleural Effusions and Empyemas in Rabbits.* H. J. Corper and O. B. Rensch. Am. Rev. Tuberc., Balt., 1920, **4**, 756–762.

The original purpose of this experiment was to find a method whereby there could be uniformly produced tuberculous pleural effusions or empyemas available for the studying of various therapeutic procedures. One set of rabbits received a subcutaneous injection of 1.0 mgm. of virulent human tubercle bacilli, one set was sensitized by an intravenous injection of 0.2 mgm. of the same culture, while a third set acted as controls. One month later all the rabbits were given an intrapleural injection of 50 cc. of 7 per cent acacia containing about 3 mgm. of a good uniform suspension of the same strain of human tubercle bacillus used before. The authors conclude:—

"1. That virulent human tubercle bacilli in fine suspension in gum saline (7 per cent acacia in physiological saline) solution injected intrapleurally on the right side into normal rabbits tend to clump and form clusters of tubercles especially toward the lower or anterior portions of the right pleural cavity and on the right lung and toward the mediastinum.

"2. That there does not seem to be any difference in the gross final results of the intrapleural injection of the living virulent human tubercle bacilli, regardless of whether the rabbits have received either a subcutaneous or an intravenous (sensitizing) injection of the same culture, one month prior to the intrapleural injection. The finer histologic tubercle differences were not studied.

"3. That in rabbits there is no more tendency to form pleural effusions or an empyema following the intrapleural injection of virulent (for guinea pigs) human tubercle bacilli in those animal having received either a subcutaneous or an intravenous injection of the same culture of tubercle bacilli one month prior to the intrapleural injection than in a normal rabbit not having received such preliminary sensitizing injection, thus making it impracticable to use this method in the rabbit for the production of tuberculous effusions or empyemas for experimental therapeutics or other studies."—T. G. H.

262. *The Effect of Prolonged Pneumothorax upon Tuberculosis of the Lungs of Rabbits, following the Intravenous Injection of Tubercle Bacilli.* H. J. Corper and B. O. Rensch. Am. Rev. Tuberc., Balt., 1920, **4**, 763–768.

Rabbits were given an intravenous injection of 0.2 mgm. of human tubercle bacilli in 1 cc. of physiological salt solution. These were divided into two parts, one set receiving every 2 or 3 days for a period of one month intrapleural injections of air on the right side, the other set acting as controls. No appreciable effect could be demonstrated upon the number or macroscopic size of the tubercles found in the lungs of the treated animals as compared to the untreated, or in the compressed right lung as compared to the noncollapsed left lung.—T. G. H.

263. *The Pulmonary Distribution of Finely Divided Suspensions Injected Intravenously into Rabbits after the Production of Artificial Pneumothorax.* H. J. Corper and O. B. Rensch. Am. Rev. Tuberc., Balt., 1920, **4**, 769–780.

When scarlet R in gum acacia-saline suspension was injected intravenously into rabbits it was distributed to both lungs, but the average of many animals by colorimetric analysis was 81 to 71 of the right lung over the left; on the basis of per gram weight of lung tissue the proportion was 11 right to 14 left. Artificial pneumothorax of the left lung for 2 weeks previous to the injection did not appreciably change the above figures, but when continued for 4 weeks the figures of right to left were 101 to 166 and 14 to 29.—T. G. H.

264. *The Use of Sodium Morrhuate in Pulmonary Tuberculosis.* Max Biesenthal. Am. Rev. Tuberc., Balt., 1920, **4**, 781–783.

The author used the sodium salt of an ethereal extract of cod liver oil of Rogers, called sodium morrhuate. Patients injected with this showed no marked diminution in sputum;

the sputum either remained positive for tubercle bacilli or became so again immediately after the injections stopped; there was no great gain in the same class, no beneficial effect on the reduction of temperature was noted. No special or serious reactions were obtained in any of the cases.—T. G. H.

265. Über die Histogenese der Tuberkel, besonders der tuberkulösen Riesenzellen. (*The Histogenesis of the Tubercle, Particularly of Giant Cells.*) F. Robbers. Virchow's Arch. f. path. Anat. (etc.), Berl., 1920, **229**, 155.

It is concluded that:

1. The activity of the tubercle bacilli and their products results in breaking up of the gelatinous and elastic ground substance.
2. As a result of these destructive processes there are formed epithelioid cells and small round cells. The normally present tissue cells may multiply by mitosis and amitosis and are thus also capable of producing epithelioid cells.
3. Before disappearing the ground substance of the developed nuclei show distinct evidence of proliferation.
4. The giant cells originate through protoplasmic fusion of larger or smaller parts of the ground substance under the inclusion of the newly formed nuclei in this region. This explains also the absence of nuclear division in the center of the giant cells, the numerous forms of the nuclei, and the coherence of the cytoplasm with the rest of the ground substance.—S. A. G.

266. Relation of Contact with Tubercle Bacillus to Development of Tuberculosis in Adults. J. B. Rogers. J. Am. M. Ass., Chicago, 1920, **75**, 1690.

Lowering of the individual resistance and other factors are required to produce tuberculosis aside from the presence of the tubercle bacillus. The elimination of clinical tuberculosis from adults depends largely upon establishment of living conditions which keep up the normal powers of individuals.—P. G. H.

267. Ein Beitrag zur Differentialdiagnose der tuberkulösen und käsig-pneumonischen Lungenphthise. (*The Differential Diagnosis of Tuberculous and Caseous Pneumonic Pulmonary Tuberculosis.*) Ballin. Berl. klin. Wchnschr., 1920, **57**, 733–734.

In all 17 cases that were diagnosed as caseous pneumonia alone or combined with tuberlosis, the sputum showed elastic fibers in alveolar structure and arrangement. In 10 cases diagnosed as tuberculosis, the elastic fibers occurred only in bundles, the alveolar structure being absent. In 14 cases clinically diagnosed as a combination of tuberculosis and caseous pneumonia both forms of elastic fibers were found 4 times while the remaining 10 gave only the alveolar structure and arrangement of the fibers. The form of the elastic fibers (stained by Weigert's method) in the sputum is a helpful aid in the differential diagnosis of these two types of tuberculosis.—B. C.

268. Beitrag zur Röntgenbehandlung tuberkulöser Halslymphdrüsen. (*Röntgen Treatment of Tuberculous Cervical Lymph Glands.*) Gerold Kneier. Berl. klin. Wchnschr., 1920, **57**, 495–496.

Tuberculous lymph glands are first thoroughly irradiated with X-rays before operative removal is recommended. This procedure has resulted in only 1.8 per cent of such cases resorting to surgical removal. Improvement is almost always the rule, and serious damage due to the X-rays has never been observed.—B. C.

269. Drei Fälle chirurgischer Tuberkulose, die durch Injektion einer HCl-Pepsinlösung behandelt wurden. (*Three Cases of Surgical Tuberculosis Treated by Injection of HCl-Pepsin Solution.*) Krahe. Berl. klin. Wchnschr., 1920, **57**, 547–548.

A solution of 10 per cent pepsin in 1 per cent HCl was injected into local tuberculous foci in 3 cases with the object of digesting away the fibrosed tissue. This treatment was not accompaned by rise in temperature. The processes disappeared and the cases were considered healed.—B. C.

DISEASES OF CHILDREN

(*See also Numbers 210, 308*)

270. Zur Behandlung der Furunkulose der Säuglinge, nebst Bemerkungen zur Hautpflege des Säuglings. (*The Treatment of Infantile Furunculosis, with Remarks on the Skin Hygiene of the Infant.*) Cassel. Berl. klin. Wchnschr., 1920, **57**, 849–850.

Thorough cleanliness and disinfection of bed clothes and linen are the important factors in treatment which are here reiterated.—B. C.

GYNECOLOGY AND OBSTETRICS

(*See also Number 285*)

271. Diagnosis of Gonorrhea in the Female by Staining Methods. Charles C. Norris and Henry B. Mickelberg. J. Am. M. Ass., Chicago, 1921, **76**, 164.

No difficulty is experienced in making a diagnosis in the acute stage of gonorrheal infections. During the chronic stage clinical symptoms are not so characteristic as during the acute stage. It is therefore more difficult to show the presence of the disease by staining during the chronic than during the acute stage. If a sufficiently large number of stains is prepared, gonococci can be demonstrated in film preparations. No dependence should be placed on single negative smears. Stains should be made by the Gram stain. Even then errors may occur. All cases should be regarded as of gonococcal origin unless proved otherwise.—P. G. H.

DERMATOLOGY

(*See also Numbers 138, 206, 254, 270, 305, 309*)

272. *Anthrax in Animal (Horse) Hair.* S. Dana Hubbard. J. Am. M. Ass., Chicago, 1920, **75**, 1687.

Samples of horse hair and brushes made from horse hair were examined and of these 80 per cent were found to be contaminated with anthrax spores. Horse hair should be sterilized before use in manufacturing brushes.—P. G. H.

273. *Ueber Flohstiche und die Urticaria pulicosa. (Flea Bites and Urticaria Pulicosa.)* Erich Hoffmann. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1028.

The occasional occurrence of urticaria following a flea bite is explained as being due to local distribution of the poison and its effect upon the contractile elements of the capillary walls. Fleas, bed bugs, etc., appear to have a predilection for certain persons. This is said to be due to attraction exerted by subtle odorous substances, which these insects can detect. —B. C.

274. *Inokulationsversuche bei Psoriasis. (Inoculation Experiments with Psoriasis.)* Carl Lennhoff. Berl. klin. Wchnschr., 1920, **57**, 782–783.

Preliminary experiments on 2 cases lead to the opinion that psoriasis is an infectious disease with an incubation period of about 14 days.—B. C.

OTOLOGY AND NOSE AND THROAT DISEASES

(*See also Numbers 209, 212, 222*)

275. *Vincent's Angina Infection: Its Prevention, Manifestations, Bacteriology and Treatment: Report of Fifty-six Cases.* Frank F. D. Reckford, assisted by M. C. Baker. J. Am. M. Ass., Chicago, 1920, **75**, 1620.

Vincent's angina is not more often recognized because smears are not made. It is frequently mistaken for diphtheria and syphilitic ulcers. The use of candy or protein with subsequent lack of cleanliness predisposes and poor teeth harbor the organism. It is more frequent during the winter months. The use of arsphenamin dissolved in glycerin is advised in the treatment of Vincent's angina and in infections when fusiform bacilli and spirochetes resembling Vincent's organism are found. The fusiform bacilli and accompanying spirochetes are one and the same, the latter being evolutionary forms of the former and are always present with the bacillus.—P. G. H.

ORAL BACTERIOLOGY

(*See Number 85*)

FILTERABLE VIRUSES

276. *Ueber die Bedingungen der Agglutininbildung durch das Fleckfiebervirus. (Conditions for the Agglutinin Formation by the Typhus Virus.)* E. Weil and A. Felix. Wien. klin. Wchnschr., 1920, **33**, 655–657.

The governing condition for formation of agglutinins for X_{19} is the living, reproducing virus. The killed virus is ineffective, as is also the living virus injected into an immunized animal. Evidently quantitative relations between antigen and immune bodies play an important rôle. These experiments offer an opportunity to test the relation of rikettsia to typhus. That the typhus agglutination with X_{19} is a genuine immunity reaction seems to be further substantiated by these observations.—B. C.

277. *Die Theorie der Weil-Felix'schen Reaktion. (The Theory of the Weil-Felix Reaction.)* Georg Wolff. Berl. klin. Wchnschr., 1920, **57**, 834–837.

In almost all cases of typhus fever there have been demonstrated specific antibodies against Bacillus X_{19}. Frequently, ordinary proteus bacilli as well as X strains have been isolated from the blood of typhus cases. Some relation between proteus bacilli and typhus cannot therefore be denied. A probable explanation is that of Epstein: that *Proteus vulgaris* originating from the intestine undergoes, through symbiosis with the typhus virus, a change in its internal structure—becomes an agglutinable "biotype" for typhus serum—and consequently becomes agglutinated in 100 per cent of typhus sera. This occurs because of a primary agglutinating property present in the typhus serum.—B. C.

278. Die Fleckfieberepidemie in Riga im Jahre 1919 unter der Bolschewistenherrschaft. (*The 1919 Typhus Epidemic in the Bolshevist Army in Riga.*) **Roman Adelheim.** Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1085–1086.

Lack of organization, information, and good-will are the reasons given for the spread of the epidemic during the 4½ months' stay of the Bolshevist army in Riga. Mortality figures for all diseases went to unbelievably high levels.—B. C.

SURGICAL BACTERIOLOGY

(*See also Numbers 86, 323*)

279. Ozon in der Wundbehandlung. (*Ozone in Wound Treatment.*) **Albert Wolff.** Berl. klin. Wchnschr., 1920, **57**, 785–786.

Ozone is an effective deodorant in gangrenous wounds. It also inhibits the growth and reduces the numbers of bacteria and stimulates the growth of granulation tissue. The present cost of the apparatus is a limiting factor in its general use.—B. C.

280. Bakteriologische Untersuchungen über Wunddiphtherie. (*Bacteriological Studies on Wound Diphtheria.*) **Herbert Lubinski.** Centralbl. f. Bakteriol. (etc.), Jena, I. Abt., Orig., 1920, **85**, 96–109.

The author in his study of bacilli in wounds in Breslau found diphtheria bacilli present in 18 out of 105 cases, and of the organisms isolated 10 were proved to be toxic to guinea pigs. He also isolated 46 times an organism which he states has not been previously described. It is a diphtheria-like form which he terms paradiphtheria bacillus. This is not pathogenic for guinea pigs and probably not for man. Differentiation between the true diphtheria and paradiphtheria bacilli is possible through the use of saccharose which is never fermented by the true diphtheria bacillus but is always fermented by the paradiphtheria form.—R. E. B.

281. Boutvuur Maligne Oedeem en "Gasbrand" Bacillen. (*Blackleg, Malignant Edema and "Gas-Gangrene" Bacilli.*) **T. Van Heelsbergen.** Tijdschr. v. Diergeneesk., Utrecht, 1919, **46**, 153–180.

A study of the subject in which the author weighs the evidence presented by previous writers as well as that revealed by his own investigations.

The term "gas-gangrene" is applied to a wound infection of man, accompanied by marked gas formation in the tissues and by a more or less extensive serohemorrhagic edema. Although blackleg and malignant edema belong within this group, they are usually excluded on account of their peculiar characteristics. This, according to the author, is perhaps proper from a clinical point of view but from a microbiologic standpoint it cannot be defended. Many investigators classify those organisms in one large group and the author is willing to join in this. When he speaks thus of "gas-gangrene" he includes the blackleg and malignant edema organisms.

At least 16 members of this group are known in literature and the author reviews the discussions pertaining to their relations. He has occupied himself during more than 2 years with this problem and as a result he ranges himself with Grassberger and Schattenfroh, who gave prominence to the great variability of these anaerobes and who wished to see them reduced to a single species. The author reviews what is written about the manner of spore formation and came to the conclusion that this is dependent on too many intercurrent circumstances to serve as a means for differential diagnosis.

Studying the evidence regarding the resistance of the spores to high temperatures he finds it possible to divide the "gas-gangrene" organisms into two large groups, i.e., the blackleg group and the malignant edema group. If one believes that these organisms originate from one parent cell, it must be recognized that in the course of time, the blackleg bacillus and the malignant edema bacillus have come to be furthest removed from one another.

The presence of erythrogranulosis and of "bloated" bacilli in the muscle tissues is very inconstant although more common in blackleg than in malignant edema.

The motility of the organisms and the presence of flagella likewise cannot be depended upon as means of diagnosis.

Of more importance is the fact that in spontaneous blackleg the organisms never form threads, which is more apt to be seen in the other members of the group under consideration. The phenomenon is, however, not a constant one according to the author.

The shape of the colonies again permits the division into the blackleg and maligannt edema groups, closed, solid colonies for the former and branched ones for the latter.

The odor of the cultures and of the animal body may permit a differentiation between blackleg and malignant edema, although this is not always certain.

The author divides the "gas-gangrene" organisms into two groups according to the acid and alkali formation by cultivation on brain mush. To the acid-formers belongs the blackleg bacillus, while the organisms of malignant edema are alkali-formers, although an absolute classification is not always possible.

The use of milk cultures cannot be relied upon for the establishment of the identity of the members of this group.

The characteristics of the muscle lesions may indicate the identity of the infection. Extensive muscular changes, black in color, dry and of spongy aspect point to blackleg, while more moist and less porous lesions are more apt to be caused by other "gas-gangrene" organisms, although in such cases blackleg cannot be positively excluded without bacteriologic examination. The formation of gas within the tissues has little diagnostic value.

The question of pathogenicity is given full consideration. Among other things it is pointed out that cavies are susceptible to both blackleg and malignant edema while chickens and pigeons are susceptible only to the latter disease. Hence those animals are of value for the purpose of differentiation. Agglutination, complement fixation and precipitation as means of diagnosis are discussed, but the author suspends judgment as to their practical value.

After a discussion of reciprocal immunity in which no positive indications of great practical value are given, the author states that but few really constant characteristics of the "gas-gangrene" bacilli are known and that those cannot be used to establish different species. He compares the group with that which includes the coli-typhoid organisms and points out that the great variability of the organisms may be responsible for the fact that under certain circumstances bad results were obtained with blackleg vaccination and that it may be of importance to study the strains of blackleg in various localities.

Tables of differential diagnostic features, a diagram showing genetic relations and a bibliography are added by the author.—L. V. E.

SEROLOGY

(See also Numbers 125, 230, 171, 208, 276, 277)

282. *The Kinetics of Inactivation of Complement by Light.* S. C. Brooks. J. Gen. Physiol., 1920, **3**, 169.

The author discusses the methods which must be used in any study of the chemical effect of light. In his study of changes produced in complement by light, he concludes that the apparent course of the photo-inactivation is that of a monomolecular reaction and that this is not a pseudo resemblance due to diffusion, for the temperature co-efficient of diffusion is much higher than that of photo-inactivation. It is noted further that there is no change in the transparency of serum solution. During the process of photo-inactivation, at least for those wave lengths of ultra-violet light which are probably most effective, "it is pointed out that under these conditions only one interpretation is possible: namely, that during photo-inactivation a single disappearing molecular species governs the rate of reaction. This substance must be primarily responsible for the hemolytic power of serum when it is used as complement."—R. E. B.

283. *The Mechanism of Complement Action.* S. C. Brooks. J. Gen. Physiol., 1920, **3**, 185.

The author's summary is as follows: "It has been shown:

"1. That complement exposed to ultra-violet light is not thereby sensitized to the action of heat (which indicates that it is not protein).

"2. That inactivation of complement by ultra-violet light is accompanied by a decrease in its surface tension.

"3. That photo-inactivation of complement is not a result of any changes in hydrogen ion concentration since these are less than 0.05 pH.

"4. That hydrogen ion concentrations high enough to transform serum proteins from the cation to the anion conditions (i.e., past the isoelectric point) permanently inactivate complement.

"These facts together with those given in previous papers lead to the following hypotheses.

"1. That there is present in serum a hemolytic substance which is formed from a precursor (which may resemble lecithin) and is constantly being formed and simultaneously being broken down into inactive products.

"2. That both precursor and lysin contain the same photosensitive molecular group.

"3. That the lytic substance is dependent for its activity upon the state of the serum proteins.—R. E. B.

284. *The Wassermann Test and its Limitations in Diagnosis and Treatment.* G. L. Rohdenburg, A. L. Garbat, Leo Spiegel and P. J. Manheims. J. Am. M. Ass., Chicago, 1921, **76**, 14.

The limitations of the Wassermann test must be understood in order to arrive at reliable conclusions from its use. One of the important limitations is due to the fact that the technic varies in different laboratories. The biologic processes involve another limitation. The success of treatment is based on the acceptance of the test in the majority of cases.—P. G. H.

285. *Value of Wassermann Reaction in Obstetrics Based upon the Study of 4547 Consecutive Cases.* J. W. Williams. Johns Hopkins Hosp. Bull., 1920, **31**, 335.

In this article the author refers in passing to the importance of syphilis as the cause of fetal death, then considers the significance of the maternal and fetal Wassermann, the value of the microscopic examination of the placenta in the detection of syphilis and finally discusses the status of Colles' law. The author is not prepared to state categorically that a positive maternal Wassermann means the mother is undoubtedly syphilitic but is able to state that it does not necessarily mean the child will develop syphilis. The author does not believe the information gained from the Wassermann test made on the fetal blood at birth is commensurate with the time consumed or the money expended. On the other hand, the demonstration of the so-called Fränkel's disease in the placenta offers twice as great a probability of giving correct information concerning the condition of the child as a positive Wassermann on the part of the mother. Williams also believes the admissibility of Colles' law has not been proved or disproved.—F. W. H.

286. *Ueber die Unvermeidlichkeit von Divergenzen in den Ergebnissen der Wa.-R.* (*Unavoidability of Divergences in the Results of the Wassermann Reaction.*) Georg Meier. Berl. klin. Wchnschr., 1920, **57**, 845–849.

A general discussion of the difficulties involved in obtaining concordant findings from different technicians and with different procedures.—B. C.

287. *"Variations in the Wassermann Reaction"—A Reply.* Robert A. Kilduffe. J. Lab. & Clin. M., St. Louis, 1920, **6**, 98–101.

Kilduffe briefly discusses certain points emphasized by Wilson (J. Lab. & Clin. M., 1920, **5**, 670–671) which are likely to confuse a clinician.—F. W. H.

288. *Ueber die Dietrichsche Komplementbindungsreaktion bei fiebernden Menschen.* (*The Dietrich Complement Fixation Reaction in Fevers.*) Arthur Mayer. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 998–999.

The blood serum of a febrile person gives a complement fixation reaction with iodothyrin as antigen (Dietrich's reaction). This reaction appears during infection fevers and anaphylatoxin fever as well as in hyperthermias following overheating or activity. It always runs parallel with an increased pyrogenetic reaction following parenteral administration of protein. It is absent during febrile athyreoses but is present in afebrile thyreotoxicoses. A positive or negative Dietrich reaction during an afebrile interval permits a differentiation between fever of nervous and infectious origin.—B. C.

289. *Ueber die serologische Typhusdiagnose bei Schutzgeimpften.* (*Serological Typhoid Diagnosis in the Prophylactically Inoculated.*) Schürer and Rosel Goldschmidt. Berl. klin. Wchnschr., 1920, **57**, 897–898.

When there occurs in the serum of a vaccinated person a weak agglutination of paratyphoid A bacilli in addition to a stronger typhoid agglutination the fact may be taken as a symptom of considerable diagnostic significance for the assumption of the presence of a typhoid infection.—B. C.

290. *Zur Theorie der Lipoidbindungsreaktion.* (*The Theory of the Lipoid Fixation Reaction.*) Ernst Meinicke. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1022–1023.

Meinicke's lipoid binding reaction consists in the precipitation of serum globulin by lipoids of alcoholic organ extracts, and has been applied to the serological diagnosis of syphilis. Present investigations indicate apparently that there are two factors involved in this reaction. One is a lipoid fixation in the sense understood by the Ehrlich school. The other is a sodium chloride transposition caused by ionic forces. Experiments with NaCl upon sera variously diluted seem to support these notions.—B. C.

291. *The Phenomenon of Vernes as Applied to the Serodiagnosis of Syphilis.* Leon H. Cornwall and Louis S. Aronson. J. Am. M. Ass., Chicago, 1920, **75**, 1697.

The lack of specificity of the Wassermann test is ascribed by the authors to the fact that organs containing no *Spirocheta pallida* are used as antigen. In spite of the labor spent on standardizing methods for carrying on the test it remains a nonspecific biologic test. Some authors believe the reaction to be dependent upon physico-chemical transformations due to the presence of albuminoid substances in the blood serum. Other methods than hemolysis have therefore been sought to detect the presence of these substances. Such attempts are the precipitoreaction, the coaguloreaction, the freezing reaction and the Bruck test. Owing to differences in technic results have frequently not been uniform and reliable. A colorimetric scale from 0 to 8 was devised by Vernes and the results of Wassermann tests recorded accordingly. He showed that although the difference between normal and syphilitic serum cannot always be detected by colorimetric reading alone, when the results are charted non-syphylitic serum always gives a horizontal line, while syphilitic serum gives varying curves. Vernes added a fine suspension of ferric hydrate to diminishing quantities of serum. After incubation for 40 minutes, flocculation occurred in certain tubes and this flocculation disappeared abruptly or progressively in a certain number of the tubes. After a certain dilution was reached no flocculation was produced. In carrying out the method a colloidal suspension is prepared from horse's heart by maceration in alcohol, desiccation and distillation under negative pressure after mixing with ethyl chlorid and absolute alcohol. This colloidal suspension was named perethynol. The desired suspension is obtained by reducing perethynol with distilled water to which an electrolyte may be added. The ingredients employed in the complete reaction are: Human serum 0.2 cc.; perethynol diluted 1:40 in 0.9 per cent NaCl, 0.8 cc.; pig serum titrated quantity in 0.9 per cent NaCl, 0.8 cc. The tubes are placed at 37°C. for one and one-quarter hours and then are added: sheep cells titrated and made up in 50 per cent hypertonic saline solution 0.8 cc. The tubes are again incubated for one-half hour and then centrifuged. After centrifugation the tubes containing normal serum are free from hemoglobin and those containing certain syphilitic serums are free from hemoglobin, but intermediate degrees of color constitute a syphilitic index which is said to be of considerable importance.—P. G. H.

SERUM THERAPY

(See also Numbers 121, 145, 191, 211)

292. *Biologic Therapy. General Considerations Regarding Serum and Vaccine Therapy.* SIMON FLEXNER. J. Am. M. Ass., Chicago, 1921, **76**, 33.

The use of serums and vaccines is based on principles of immunity recognized at the present time. With proper laboratory equipment and personnel the manufacture of serums and vaccines has become relatively simple. Diphtheria and a few other antiserums and antityphoid vaccination have been successful. but other therapeutic agents of this nature have not yet been successfully applied. The fact that a successful serum is produced from one organism does not prove that the same can be done with other organisms. Meningitis and dysentery serums are successful in a measure when they are prepared from the most prevalent strains of the organisms. Antipneumococcic serum has been successful only for Type I. Vaccines have been successful in the case of typhoid fever and in a less degree for cholera and bacillary dysentery and possibly in some types of pneumonia.—P. G. H.

293. *I. Antistreptococcus Serum and Streptococcus Vaccines.* GEORGE H. WEAVER. J. Am. M. Ass., Chicago, 1921, **76**, 34.

Antistreptococcus serums have not proved of great routine value. A laboratory diagnosis should precede their use and they seem to owe their value to the specific opsonins. These are not present in high concentration and large doses therefore must be applied. Active leucocytes are essential in the process of destruction of streptococci. Polyvalent serums are prepared in order to render them effective in different sorts of streptococcus infections. But with the increase in number of strains the curative value of each strain is lessened and a separate serum should therefore be prepared for each strain. Wounds caused bv streptococci may be bathed with the serum. In streptococcus meningitis 20 to 30 cc. may be injected intraspinally, and intravenous and intramuscular injections may be made. Intrapleural injections mav be given after aspiration. Serum reactions following these injections may seriously interfere with the patient's reserve strength. The patient's susceptibility to horse serum may be determined by an intradermal injection of a small amount of serum. Streptococcus vaccines should always be autogenous.—P. G. H.

294. *III. The Use of Antimeningococcus Serum in the Treatment of Epidemic Meningitis.* KENNETH D. BLACKFAN. J. Am. M. Ass., Chicago, 1921, **76**, 36.

Antimeningococcus sera were first prepared by Jochmann, Kolle and Wassermann, and Flexner and Jobling. Introduction of serum into the lumbar subarachnoid space of patients has been satisfactory. During the preserum period the mortality was 60 to 80 per cent in various countries and since the use of serum it has been reduced to 30.9 per cent. Unsatisfactory results are largely due to the absence in the serum of corresponding antibodies and to lack of sufficiently intimate contact with the disease process. The serum should be polyvalent and should be standardized against representative strains of meningococci. Agglutination tests should be made when the serum is unsatisfactory to determine its agglutinability in comparison with that of the strain causing the disease. Serum should be injected as early as possible. It should be injected into the spinal canal or into the ventricles or into both. It should be injected in as large amounts as is safe since its value consists in the destruction of the organisms. Serum disease follows injection in from one-third to one-half the cases.—P. G. H.

295. *IV. Serum Treatment of Bacillary Dysentery.* SIMON FLEXNER. J. Am. M. Ass., Chicago, 1921, **76**, 108.

Two groups of dysentery bacilli exist, the Shiga type and the Flexner type containing several kinds of bacilli distinguishable by minor cultural and immunological properties. The Shiga bacilli yield two toxins, one soluble in the surrounding medium and one more closely fixed to the cell protoplasm. The soluble toxin attacks the central nervous system in rabbits while the second attacks the intestinal tract. The treatment with antidysenteric sera prepared from horses has been of great value. It should be given as early as possible. The serum is usually injected subcutanously, but may be injected intravenously. The average dose is 20 cc. for an adult, but may be given in doses of 50 to 100 cc. The dose may have to be repeated in 12 to 24 hours and after 48 hours. The beneficial effects appear promptly. Acute cases are especially amenable to treatment with serum. Serum treatment reduces the mortality in mild epidemics from 10 to 15 per cent to 1 to 2 per cent. Polyvalent sera mav be given in doses of 5 cc. as a prophylactic.—P. G. H.

296. V. The Use of Antitoxin in the Treatment of Diphtheria. **William H. Park.** J. Am. M. Ass., Chicago, 1921, **76**, 109.

The soluble toxin of the diphtheria bacillus is the chief cause of local lesions and constitutional effects. The endotoxins produced by the bacillus have probably no appreciable effect. Antitoxin is effective in uncomplicated cases. Intramuscular injection of antitoxin facilitates absorption, it being about three times as rapid as subcutaneous injection. Intravenous injection renders the antitoxin almost immediately available. Immensely large doses of antitoxin are given so as to reach the toxin quickly and in adequate amounts. Antitoxin remains in the body for several days. When given intravenously the blood has its highest antitoxin content immediately. When given intramuscularly or subcutaneously the highest antitoxin content is after 24 to 72 hours. A single dose therefore is usually all that is required, if the dose is sufficiently large. An insufficient first dose cannot be wholly compensated for by later injections. Immunization of those exposed is accomplished by administration of 500 to 1000 units. Intravenous injection may be followed by a chill and temperature lasting about 2 hours. Urticaria may develop in 2 to 7 days. In rare cases attacks of asthma may follow and in about one case out of 70,000 death has occurred.—P. G. H.

297. Ueber die Behandlung der Diphtherie mit normalem Pferdeserum. (The Treatment of Diphtheria with Normal Horse Serum.) **Hans Meyer.** Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1048–1049.

Seventeen children with mild diphtheria were treated with intravenous injections (2.5 to 10 cc. according to the extent of membrane formation) of antitoxin-free horse serum. In 9 of them there was a decidedly favorable effect, but this nonspecific protein therapy cannot compare as a remedy with the specific antitoxic serum.—B. C.

298. VI. The Serum Treatment of Acute Poliomyelitis. **Harold L. Amoss.** J. Am. M. Ass., Chicago, 1921, **76**, 110.

Effective serum against poliomyelitis has so far not been produced in animals other than human beings and monkeys. The serum is collected from human beings and the donor is examined by the Wassermann test. From 500 to 700 cc. may be drawn. The serum is inactivated by heating at 55°C. for one hour and tested for sterility. It is preserved with 0.2 per cent trikresol. The serum is injected intraspinally and intravenously. The results have been very satisfactory.—P. G. H.

299. VII. Antipneumococcus Serum. **Rufus Cole.** J. Am. M. Ass., Chicago, 1921, **76**, 111.

Types I, II and III have very specific immunologic properties. The serum prepared for Type I is of great value, while serum prepared for the other types is not so efficient at present as to justify its use as a routine measure. It is important, therefore, that the type of pneumococcus be determined before serum is applied. The serum is prepared by injecting horses with killed cultures at first, followed by living cultures. The potency is determined by injection of mice. The potency should be such that 0.2 cc. of the serum will protect a mouse against at least 0.1 cc. of an 18-hour culture. Treatment should be given as early in the disease as possible and the serum should be injected intravenously. The amount of a first dose is 90 to 100 cc., to be repeated every 8 hours until the temperature falls and the symptoms ameliorate. The total amount is 200 to 300 cc., although as much as 1000 cc. may be given. The effect of the serum is judged by the blood becoming sterile, the progress of the lesions in the lung being arrested, the amelioration of symptoms and the reduction of the mortality. In the Hospital of the Rockefeller Institute the mortality in cases of Type I was reduced from 25 to 30 per cent to 9.2 per cent. Untoward effects may follow the administration, namely anaphylactic shock, thermal reaction and the so-called serum disease.—P. G. H.

300. VIII. Use of Tetanus Antitoxin in Prevention and Treatment of Tetanus. **Matthias Nicoll.** J. Am. M. Ass., Chicago, 1921, **76**, 112.

Experience during the war has demonstrated the importance of prompt administration of tetanus antitoxin and the cutting away of all dead tissue. In all cases of suspicious wounds an immunizing dose of 1000 units should be given promptly. For curative purposes it is especially important to give antitoxin early as every hour lost materially reduces the chances. Subcutaneous injection is of doubtful value, intravenous injection has proved disappointing, while the intraspinal method has been demonstrated to be valuable beyond question.—P. G. H.

301. The Treatment of Acute Tetanus. **Robert A. Kilduffe and W. B. McKenna.** J. Am. M. Ass., Chicago, 1921, **76**, 20.

For neutralization of tetanus toxin the only treatment is the early and vigorous administration of tetanus antitoxin. Antitoxin was injected intravenously in the case reported, and the blood kept saturated with antitoxin. Large doses of antitoxin were given, the amounts being as follows: September 20, 10,000 units at 9 a.m.; 25,000 units at 2.30 p.m.; September 21, 20,000 units at 9 a.m.; 20,000 units at 6 p.m.; September 22, 20,000 units at 9 a.m.; September 23 and 24, 20,000 units at 9 a.m. of each day. September 25, 5000 units at 9 a.m. The patient recovered.—P. G. H.

302. *Bereidung, controle en werking van het Mil tvuurserum.* (*Preparation, Testing and Activity of Anthrax Serum.*) H. E. Reeser. Med. v. d. Rijksseruminrichting, Rotterdam, 1917, **1**, 206–207.

A complete and thorough discussion of the subject closing with the following conclusions:

1. In anthrax serum we possess a powerful preventive and curative agent for combating anthrax. All cases of anthrax, in man as well as in animals, should be injected with this serum as soon as possible.

2. Anthrax serum can be practically and properly tested by means of rabbits, according to the method of Sobernheim. Standardization of the culture to be used should precede the serum test. For infection, the rabbits should receive about one hundred times the minimum lethal dose.

3. There exists, contrary to what Kraus and Beltrami have observed, a very great difference in action between normal serum and anthrax serum as it pertains to preventive and curative activity with regard to anthrax bacilli.

4. Anthrax bacilli, placed under the skin of horses, highly immunized against anthrax, retain their full virulence for at least eight days.

5. Anthrax serum contains neither bacteriolytic, agglutinating, bacteriotropic nor complement fixing substances.

6. Neither can there be question of an "antiblastic immunity" because the anthrax bacilli, contrary to what is maintained by Ascoli, form in the body of highly immunized animals truly beautiful capsules.

7. It must be concluded that anthrax serum only destroys the substances which are secreted by the bacteria and which paralyze the defensive processes of the body. There is thus some similarity between the action of anthrax serum and an antitoxic serum.

8. On agar slants, to which defibrinated blood has been added, the anthrax bacilli form capsules just as in the animal body.

A very complete bibliography is added to this paper.—L. V. E.

VACCINE THERAPY

(*See also Numbers 129, 134, 145, 191, 234, 289*)

303. *Prophylactic Inoculation against Yellow Fever.* Hideyo Noguchi and Wenceslao Pareja. J. Am. M. Ass., Chicago, 1921, **76**, 96.

Guinea pigs were vaccinated with cultures of *Leptospira* and when sufficient quantities were given the animals were usually resistant to subsequent infection. The degree of protection is not strictly proportional to the amount of vaccine inoculated.

A number of soldiers and civilians in Mexico were similarly vaccinated. A few of these contracted yellow fever after vaccination. The authors, however, regard the results of vaccination of human beings as distinctly encouraging.—P. G. H.

304. *II. Use of Vaccines and Serums in Gonorrheal Urethritis and its Complications.* John T. Geraghty. J. Am. M. Ass., Chicago, 1921, **76**, 35.

Gonorrheal vaccines as first suggested are of no value. Polyvalent, autogenous and stock vaccines are equally of no value. Response to treatment with vaccines in gonorrheal infections is not the result of a specific action of the vaccine, but has been obtained by the use of other vaccines and foreign proteins. When favorable results have been obtained in gonorrheal infections the complications have been so severe as to be attended by possible danger. Gonorrheal vaccine is utterly useless in the treatment of acute or chronic gonorrheal urethritis. In acute gonorrheal epididymitis the intramuscular use of horse serum is followed in about 50 per cent of the cases by subsidence of pain and tenderness. From 5 to 15 cc. of serum are injected into the lumbar or gluteal muscles.—P. G. H.

305. *Biologic Therapy. IX. Acne Vaccine Therapy.* Martin F. Engman. J. Am. M. Ass., Chicago, 1921, **76**, 176.

In certain types of acne, vaccines are of considerable value. The effect of suspensions of the acne bacillus is best seen in acne vulgaris. The suspension is of less pronounced effect in superficial types. Failures to obtain results have been due to too large doses or too frequent administration of the vaccine. As the organism is difficult to grow on artificial media autogenous vaccines are almost prohibitive. Stock vaccines have been efficient. The initial dose should be 3 to 5 million and should be repeated in 5 to 7 days, the interval to be judged from the reaction. Local hyperemia in the form of hot towels or that resulting from manipulation should be used on the third day after each injection and not before. If new lesions continue to appear after the third day, from 7 to 10 million should be given. If many new lesions form within 48 hours after injection the dose should be decreased and the interval between dosage extended. A much larger dose is indicated if many new lesions appear after the third day. Staphylococcus vaccine in acne vulgaris is of little value. The same holds for a vaccine composed of staphylococci and acne bacilli. No untoward effect has been observed by use of the vaccine excepting a slight local reaction at the point of injection. —P. G. H.

306. X. Vaccination against Typhoid and Paratyphoid Fevers. F. F. Russell and H. J. Nichols. J. Am. M. Ass., Chicago, 1921, **76**, 177.

There is no question of the power to prevent infection by the use of typhoid vaccine. Some cases occur among the vaccinated, but these are few. Results in the army are as good as vaccination against smallpox. Typhoid vaccine contains 1,000,000,000 bacteria per cubic centimeter. Vaccines containing paratyphoid bacilli A and B contain 750,000,000 per cubic centimeter. Sensitized living vaccines involve the danger of multiplication under favorable conditions. Vaccines with killed bacteria give ample protection and are safe. Lipovaccines are greatly inferior to vaccines in physiologic salt solution. The vaccine is given in three doses 7 to 10 days apart. Longer or shorter intervals are not objectionable. The best time for administration is four in the afternoon. The best site is the upper arm at the insertion of the deltoid where the subcutaneous tissue is loose. Administration should always be subcutaneous. Intradermal or intravenous injections are followed by severe reactions. A local reaction occurs almost invariably. The redness and swelling may extend to the wrist or upwards to the clavicle. Axillary lymph nodes may be swollen. The inflammation subsides in a day or two. A general reaction may be mild or severe or absent. This general reaction consists of rise of temperature, nausea, vomiting and sometimes diarrhea and albuminuria. The symptoms subside in a few days. The maximum of antibodies appears in about 3 weeks. Immunity continues and lasts for years although it diminishes. Vaccination is indicated when the possibility of infection appears. The infection may be communicated through water, milk, other raw foods and from carriers. Danger of infection is greater in rural communities than in cities. Travelers are more exposed than natives.—P. G. H.

307. XI. Pneumococcus Vaccine. Russell L. Cecil. J. Am. M. Ass., Chicago, 1921, **76**, 178.

Stock vaccines of pneumococcus are usually polyvalent while autogenous vaccines are monovalent. Pneumococci are cultivated in broth or glucose broth for 18 to 24 hours. The culture may be used after the cocci are killed or may be centrifugalized and the sediment suspended in physiologic salt solution. Pneumococcus lipovaccine is not as efficacious as salt solution vaccine. Administration should be subcutaneous. If injected intravenously it produces a severe constitutional reaction. It is administered in doses of from 10 to 1000 million cocci per cubic centimeter or more. In the army 3 to 9 billion were used of the saline vaccine. Three injections were given at intervals of 7 days. Reactions are in proportion to the dosage. It is desirable, therefore, to administer the dose in as many small inoculations as practicable. The nature of the reaction is similar to that of other vaccines. Prophylactic vaccination is indicated whenever large groups of individuals are living together under abnormal conditions. The incidence rate of pneumonia is decidedly lower among the vaccinated than among the unvaccinated. The use of partially autolyzed pneumococci has been advocated in the treatment of pneumonia. As the disease is varied and uncertain it is difficult to decide whether the vaccine or some other factors are influential.—P. G. H.

308. Practical Applications and Uses of the Schick Test. Abraham Zingher. J. Lab. & Clin. M., St. Louis, 1920, **6**, 117–123.

Zingher discusses the factors influencing the reliability of the Schick test, active immunization of infants against diphtheria, mixture of toxin-antitoxin used for the immunization and the practical applications of the Schick test.

The author concludes that diphtheria still being widely prevalent with a more or less constant morbidity and mortality, all children between the ages of 6 months and 2 years should be actively immunized with toxin-antitoxin mixture. Also all children over 2 years old giving a positive Schick reaction should be actively immunized. By the application of the Schick test and by the administration of prophylactic doses of antitoxin to the susceptible diphtheria can be completely controlled in homes, institutions and schools.—F. W. H.

309. Ueber die therapeutische Wirksamkeit eines durch Verdauung von Trichophytonkulturen gewonnenen Präparates (Joannovics). (The Therapeutic Effect of a Trichophyton Culture Digest.) Herbert Fuhs. Wien. klin. Wchnschr., 1920, **33**, 653–654.

Digest of trichophyton cultures prepared according to Joannovics was injected subcutaneously and intracutaneously in 26 cases of infection with this fungus. The digest was found to be effective and therapeutically equivalent to the trichophytins of Bloch, of Busson and of Scholtz. It differed from these however in causing a progressive dry resorption of the infiltrations with almost complete absence of an observable inflammatory focal reaction.—B. C.

NON-SPECIFIC THERAPY

310. Zur Therapie und Pathologie der Abbaukrankheiten des Nervensystems. Heilwirkungen von Proteinkörpern auf die Epilepsie. (Therapy and Pathology of Degenerative Diseases of the Nervous System. Curative Effect of Proteins upon Epilepsy.) Döllken. Berl. klin. Wchnschr., 1920, **57**, 893–895; 926–931.

The degenerative diseases are associated as a group of the organic neuropathies with common basic characters. All the different forms are alike in that they show, after running their complete course, first, strong irritation symptoms and later, malfunction of the affected regions. This applies to alcoholism and general paralysis as well as to dementia precox or encephalitis.

These various diseases appear to respond favorably to parenteral treatment with foreign protein, especially sterile fresh milk and casein. The majority of epileptics show before the attacks (1) protein retention and disturbance of the protein metabolism, and (2) increased destruction of protein of the brain cells. This destruction may be due to gross mechanical damage to the brain, like apoplectic hemorrhages, to wounds, to infectious processes or to toxic damage by alcohol and lead. At least 75 per cent of epileptics have organic disease of the brain, *i.e.*, degenerative disease. The best protein mixture for the nonspecific protein therapy of epilepsy is the easily assimilable cow's milk.—B. C.

EXPERIMENTAL INFECTION

(*See also Number 274*)

311. Untersuchungen über die experimentelle Streptokokkeninfektion der Maus. Ein Beitrag zum Problem der Viridanssepsis. (*Studies in Experimental Streptococcus Infection of the Mouse. A Contribution to the Problem of Viridans Sepsis.*) MAX H. KUCZYNSKI AND ERICH K. WOLFF. Berl. klin. Wchnschr., 1920, **57**, 777–782; 804–807.

An experimental study of "depression immunity," an immunity causing depression in virulence of organisms concerned with chronic infections. *S. viridans* is found to lose certain of its toxic characters in experimentally produced chronic streptococcus infections. It is believed that the so-called viridans sepsis is not due to *S. viridans*. Viridans sepsis arises rather somewhat like a stationary variety in an organism infected with ordinary pathogenic streptococci and in which there is a certain balance between resistance and bacterial aggressiveness. Viridans sepsis is the sepsis of highly resistant individuals.—B. C.

312. Zur Frage der Depressionsimmunität. Studien über Superinfektion mit Hühnercholerabazillen. (*Depression Immunity. Studies on Reinfection with Chicken Cholera Bacilli.*) MAX BERLINER AND S. CITRON. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 997–998.

The subcutaneous injection into a guinea pig of a sublethal dose of chicken cholera bacilli of extreme virulence produces a condition in this animal whereby acute death does not result when, on the following day, it is injected intraperitoneally with a multiple of a positively fatal dose. In this case, the intraperitoneal infection produces a result which ordinarily occurs only after a subcutaneous infection. This observation indicates that within 24 hours certain protective immunological processes have been brought into play, processes which Morgenroth and his colleagues have termed "depression immunity," *i.e.*, a depression in virulence is imposed upon organisms involved in a reinfection (Superinfektion). —B. C.

CHEMOTHERAPY

(*See also Numbers 243, 264, 269*)

313. An Experimental Investigation of Certain Features of the Pharmacological Action of Salvarsan. D. E. JACKSON AND G. RAPP. J. Lab. & Clin. M., St. Louis, 1920, **6**, 1–16.

The authors found first class preparations have almost no direct action on the bronchial musculature of the dog. Immediate action on the pulmonary blood pressure is exerted by the smallest dose of salvarsan and when this pressure has been greatly raised, adrenalin tends to lower it and to restore the excursions of the pulmonary pressure due to respiratory movements of the lungs when these have been greatly reduced by the salvarsan. This effect is due to the action of adrenalin on the systemic vasculature. Introduced into the general circulation by way of the femoral artery the pulmonary pressure is raised by salvarsan to a less degree than when injected into the femoral vein. Injected into the portal vein salvarsan produces little, if any, effect on the pulmonary blood pressure unless the dose is very large, when the slight increase of pressure is apparently due to an increased volume of fluid in the vessels. The authors believe this action of the liver is brought about by a precipitation of the drug in the capillaries and arterioles of the liver and that it is not analogous to its detoxicating action on many poisons. The precipitation occurs quickly but does not prevent some part of the drug from passing into the general circulation for the systemic pressure may fall to a proportionately much greater degree than the pulmonary pressure. —F. W. H.

314. Zur Theorie der chemotherapeutischen Leistung. (*The Theory of Chemotherapy Activity.*) HANS LANGER. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1015–1016.

Among the derivatives of a chemical group, the effectiveness depends upon the solution state of the derivative. The optimum solution state is one in which there is an optimal distribution of diffusion power and aggregation as related to the bacterial variety under consideration. Chemotherapeutic power depends upon how far the dispersion-reducing influence of the blood, tissues and cells upon the derivative causes it to approach or leave this optimum. The broader the zone of approach to optimum aggregation, the greater is the internal disinfection to be expected; the smaller the zone, the more effective should be the application to local tissue antisepsis.

Study was made upon derivatives of the acridine series of dyes (trypaflavin, flavicide, etc.). Given a chemical group, the important point chemotherapeutically is its physical state. For a disinfectant is effective in proportion to the degree that it is taken up within the bacterial cell. With reduced *diffusivity* and increased aggregation there occurs not only an increase in the absolute disinfecting power but also in the relative.—B. C.

315. Nierenschädigende Wirkung des Quecksilbers bei kombinierten Hg-Salvarsankuren? (*Renal Damage of Mercury in Combined Hg-Salvarsan Treatment?*) G. Stümpke. Berl. klin. Wchnschr., 1920, **57**, 732–733.

In normal kidneys, danger of renal damage by mercury in anti-syphilitic treatment is usually rather remote. Even in functionally impaired kidneys, such damage is problematical. Consequently, mercurial treatment where indicated should not be withheld because of such fears.—B. C.

316. Ueber den Einfluss von Serum auf die Toxizität von chemischen Mitteln und Eiweisskörpern. (*The Effect of Serum upon the Toxicity of Chemical Agents and Proteins.*) B. Spiethoff. Berl. klin. Wchnschr., 1920, **57**, 797–798.

The lethal dose of a chemical substance (like salvarsan) is increased when it is administered dissolved in homologous serum. On the other hand, proteins under the same conditions show a greater toxicity. These phenomena are important from the therapeutic standpoint.—B. C.

317. Ueber die chemotherapeutische Wirkung einiger Farbstoffe im Tierversuch gegenüber bakteriellen Infektionen. (*The Chemotherapeutic Effect of Certain Dyes in Animal Experiments with Bacterial Infections.*) F. Neufeld, O. Schiemann and Baumgarten. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1013–1015.

The chemotherapeutic control of bacterial infections is possible to a greater degree than has hitherto been assumed. Study of acridine compounds in this regard has shown that they possess a wide range of action in spite of a certain amount of selective effect. It is observed in animal experiments that sub-therapeutic doses of the disinfectant appear to accelerate the infection in a way analogous to the growth-accelerating effect of minute amounts of disinfectant upon bacteria *in vitro*.

Experiments on mice with other dyes yielded the following results:

	ANTHRAX			CHICKEN CHOLERA	
	Brilliant green	Crystal and methyl violet	Dahlia	Acridine orange	Aurophosphin
Saved	7	5	3	7	1
Death delayed	1	1	4	2	2
Died of dye-poisoning	10	7	—	1	2
Died of infection	7	20	10	14	1
Totals	25	33	17	24	6

—B. C.

318. Ueber die giftablenkende Wirkung des Lezithins. (*The Detoxicating Property of Lecithin.*) H. Leo. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1045–1046.

The effect of intravenous injection of lecithin emulsion upon the action of drugs like morphine, strychnine and camphor was studied. The poisonousness of toxins as well as of these drugs seems to be reduced by the lecithin. This effect of the chemically indifferent lecithin must be ascribed to some physico-chemical process.—B. C.

319. Ueber chemotherapeutische Versuche mit "205 Bayer" einem neuen trypanoziden Mittel von besonderer Wirkung. (*Chemotherapeutic Studies with "205 Bayer," a New Trypanocidal Agent of Marked Effect.*) L. Haendel and K. W. Joetten. Berl. klin. Wchnschr., 1920, **57**, 821–823.

The composition of "205 Bayer" is secret for the present. Laboratory experiments have shown it to possess a high trypanocidal action and have led to the hope that the substance will be effective not only therapeutically, but prophylactically as well.—B. C.

320. Resistenzveränderung und zelluläre Leistungssteigerung in ihrer Bedeutung für Infektion und Neoplasma. (*Modification in Resistance and Cellular Activation in Their Significance to Infection and Neoplasms.*) Paul Lindig. München. med. Wchnschr., 1920, **67**, 982–983.

Casein injected intravenously in proper dosage has a marked effect in increasing the resistance of the body to certain local and generalized infections. In puerperal infections such treatment is almost a specific. Intravenous casein injections in conjunction with irradiation have proven beneficial against carcinoma.

The peculiar size, structure and ready decomposability of the casein molecule contribute to activate intracellular enzymes which combat disease conditions. Injected casein acts catalytically in that it induces hydrolytic and oxidative decompositions which play a rôle in the destruction of toxins. Casein causes a great production of proteases in the blood stream and these proteases are active against toxic and bacterial substrates. These proteases act heterolytically in that they substitute for the inadequate autolytic elements in focal infections.—B. C.

321. *Ueber Mercedan.* (*Mercedan.*) JACOBY. Berl. klin. Wchnschr., 1920, **57**, 761–762.
Mercedan is stated to be a Na-Hg salt of para-nucleic acid. It was tested upon 273 syphilitics and found to be effective without troublesome after-effects. —B. C.

322. *Ueber die Ausscheidung des Vuzins.* (*The Excretion of Vuzin.*) EDUARD BOECKER. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1020–1021.
How is vuzin (used in deep antisepsis and having a strong affinity for tissue elements) excreted, and is this excretion different from that of quinine? After the taking of considerable doses of vuzin by mouth, this alkaloid is excreted in very small amount (less than 1.7 per cent) in the urine as compared with that (22–26 per cent in the first 24 hours) of quinine. The amount of excretion of vuzin by way of the feces was very small.—B. C.

323. *Yatren, ein ungiftiges Tiefantiseptikum.* (*Yatren, a Non-toxic Deep Antiseptic.*) W. DIETRICH. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1080–1081.
Yatren (5-iodo-8-oxyquinolin-7-sulfonic acid) is a useful antiseptic in deep wounds. It offers no unusual hope in cases of generalized septic and pyemic infections, but it is nonpoisonous and harmless toward erythrocytes, leucocytes and tissue elements. Consequently, it should be effective in circumscribed infections.—B. C.

BOOK REVIEWS

324. *Traité de pathologie medicale et de thérapeutique appliquée.* (*Medical Pathology and Applied Therapeutics. Parasitic Infections.*) ÉMILE SERGENT, L. RIBADEAU-DUMAS, L. BABONNEIX. Vol. 14. Infections parasitaires. A. Maloine & Fils, Paris, 1921.

This volume, the fourteenth of the *Traité de pathologie médicale et de thérapeutique appliquée*, edited by Sergent, Ribadeau-Dumas and Babonneix, is one of the best monographs upon parasitic infections that the reviewer has encountered, well up-to-date, and accurate and scientific in the treatment of the subjects considered.

The work is divided into four parts, treating of infections with helminthes, the myiases, infections with protozoa, and the mycoses.

In a short introduction, M. Neveu-Lemaire discusses the subject of parasitic infections in general in an instructive manner, giving an adequate summary of the subject as it stands to-day. The same author then considers infections due to the helminthes, and his descriptions of the morphology and life history of the various worms infecting man are most excellent, as are the discussions of the symptoms produced by them and the methods of treatment. The descriptions of the life cycle of the various trematodes embrace all the recent researches upon this important subject and are the most accurate that the reviewer has observed in any work, even in those devoted entirely to animal parasites. In fact this entire section of the book is notable because of the inclusion of the results of the most recent researches regarding these most interesting and important parasites.

The section of the work devoted to infections with protozoa contains many valuable descriptions, the most notable being those by Neveu-Lemaire on trypanosomiases, Paisseau upon typhus fever; Gouzien upon yellow fever; Paisseau upon malaria; and Abrami upon dysentery. All of these chapters are adequate and accurate in the treatment of the subject considered and contain the most recent discoveries relating to etiology, prophylaxis and treatment. For instance, in the consideration of yellow fever, Gouzien describes fully the spirochete, *Leptospira icteroides*, discovered by Noguchi, and emphasizes its apparent importance in the etiology of the disease.

In the discussion of malaria by Paisseau, it is unfortunate that he uses the name *Plasmodium praecox* for the aestivo-autumnal or malignant tertian plasmodium, as there is no warrant for the use of *praecox* as a specific name for this parasite, the proper name being *Plasmodium falciparum*. His discussion of the treatment of malaria is too brief to be of any great value to the practitioner, especially in tropical regions where pernicious types are common. Otherwise this chapter is excellent and a model of brevity and accuracy.

In the chapter upon dysentery by Abrami, he divides the dysenteries into two great classes, bacillary and amebic, and merely mentions other causes of dysenteric conditions. He considers both classes of dysentery very fully and well, but his description of *Endamoeba histolytica* will be of little service as an aid to diagnosis.

The last section of the book is devoted to a consideration of the mycoses, by M. Louis Raymond, and is an excellent contribution to the subject. The author considers infections caused by *Aspergillus fumigatus, Endomyces albicans, Sporotrichum Beurmanni, Actinomyces bovis*, and the oosporoses and blastomycoses; the chapter contains much valuable material relating to diagnosis and treatment.

All in all, this work is one that can be recommended both to the general practitioner and the laboratory worker, as both may profit from its perusal. It is well illustrated and printed. —C. F. C.

MISCELLANEOUS

325. *Auftreten und Bedeutung der Rundzellen bei den Gewebskulturen.* (*The Origin and Significance of Round Cells in Tissue Cultures.*) O. Busse. Virchow's Arch. f. path. Anat. (etc.), Berl., 1920, **229**, 1.

The author shows that round cells arise from reticular highly developed spindle and Kupfer's cells when the culture is injured by bacteria, autotoxin or digestive substances (trypsin). A large part of the cells that resemble lymphocytes, however, are alive, capable of multiplication and may again produce tissue cells.

The disintegration and liquefaction of the cell cultures is a process which is to a certain degree analogous to liquefaction of the tissue in suppuration. In both processes the infiltrating cells resemble polynuclear wandering cells.

Experimental inflammation produced by Lippmann and Brückner, in an aleucocytic animal further shows that the cells of the inflammatory infiltration and of the exudate originate in the tissue.—S. A. G.

326. *Ueber monochromatische Lichtbehandlung.* (*Monochromatic Heliotherapy.*) Franz Nagelschmidt. Berl. klin. Wchnschr., 1920, **57**, 783–785.

Red and infra-red rays are stated to possess anti-leucotactic properties and to retard suppurations. Normal skin is not affected by the rays, but in hyperemic, inflamed skin there follows a sedative effect. Cases are cited showing that pain is also diminished by exposure to these rays from a neon lamp.—B. C.

327. *The Removal of Particulate Matter from the Pleura.* Howard T. Karsner and C. E. Swanbeck. J. Med. Research, Bost., 1920, **42**, 91–98.

This study is concerned with phagocytosis of particulate matter by the pleural endothelium, and with the transport of the material. Cats were used throughout the experiment. In the earlier work carmine was employed as the particulate matter but the partial solubility of this substance determined the subsequent use of lampblack. The pleural endothelium over all surfaces, but particularly over the mediastinum and lung, showed phagocytic powers. There was histological evidence that the surface endothelium after phagocytosis may migrate to the underlying lymphatics, for phagocytic cells of this sort were found immediately below and in close relation to the surface cells as well as about the lymphatic vessels.—A. C. E.

328. *Zur Pathogenese der Epilepsie.* (*The Pathogenesis of Epilepsy.*) Tillman. Virchow's Arch. f. path. Anat., (etc.), Berl., 1920, **229**, 40.

The author comes to the conclusion that epilepsy is not a spontaneous disease, but only the expression of an organic disease of the brain and its meninges.—S. A. G.

329. *Om Haemochromatosis ossium ("ochronosis") hos husdyrene.* (*Hemochromatosis Ossium ("Ochronosis") in Domestic Animals.*) A. M. Sorensen. Kgl. Vet.-og Landbohøjsk. Aarsskr., 1920, København, pp. 122–139.

Pigmentation of the periosteum and bones of cattle and pigs is occasionally observed by meat-inspectors. The pigmentation of the periosteum is a melanosis, but that of the bone tissue itself has formerly been referred to as ochronosis. Since this condition is entirely different from the ochronosis of man described in 1866 by Virchow, Schmey ("Ueber Ochronisis bei Mensch und Tier," *Frankfurter Zeitschr. f. Path.*, 1913, **12**, 218) has suggested the name *osteo-haemachromatosis*.

The author has observed three cases in cattle. Microscopic examination revealed finely granular, iron-containing pigment in the osseous tissue, but not in the bone-cells. In one case, in addition to the pigmentation of the bones, there was also pigmentation of the liver and kidneys and their associated lymph glands. In the liver the pigment was deposited mainly in the peripheral part of the lobules, and occurred in both the hepatic cells and in the cells of Kupfer. In the former the pigment contained iron; in the cells of Kupfer iron was absent, as shown by chemical tests. The pigmentation of the kidney was accompanied by degeneration and necrosis of the epithelium. The hepatic and renal lymph glands contained pigment in their lymph sinuses, most of the pigment giving a negative reaction with tests for iron.

Spectroscopic examination appeared to relate the pigment to hematoporphyrin. It seems therefore likely that it is derived from hemoglobin, and its deposition is probably due to an abnormal destruction of the red blood corpuscles. There may be a connection between osteo-haemochromatosis and "haematuria" in bovines. (Abs. in Vet. Rev., Edinb., 1920, **4**, 290.)—W. A. H.

330. *Aneurysmen und Bildungsfehler der arteria Communicans anterior.* (*Aneurisms and Malformations of the Anterior Communicating Artery.*) O. Busse. Virchow's Arch. f. path. Anat., (etc.), Berl., 1920, **229**, 178.

Fatal hemorrhage of ruptured aneurisms of the arteries of the brain is most common in the anterior communicating artery; syphilis plays no rôle in forming these aneurisms. He gives data of 400 cases with numerous figures.—S. A. G.

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ABSTRACTS
OF
BACTERIOLOGY

UNDER THE EDITORIAL DIRECTION OF THE
SOCIETY OF AMERICAN BACTERIOLOGISTS

MARCH, 1921

EDITOR
A. PARKER HITCHENS

It is characteristic of Science and Progress that they continually open new fields to our vision.—PASTEUR

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ABSTRACTS OF BACTERIOLOGICAL LITERATURE

CHARACTERIZATION AND CLASSIFICATION

(See also Number 562)

331. *Les propriétés des microbes lactiques; leur classification.* (*Lactic Acid Bacteria: Their Properties and Classification.*) P. van Steenberge. Ann. de l'Inst. Pasteur, Par., 1920, **34**, 803–870.

The term "lactic acid bacteria" is applied in this paper to the microörganisms which have the general properties ascribed to the group by Beijerinck. These characteristics are: The bacteria are non-motile, facultative anaerobes, non-sporogenous, requiring carbohydrates and peptonized nitrogenous substances for their nutrition, form small colonies even on the most favorable media, form lactic acid, with small amounts of volatile acids and CO_2, have no catalase and are therefore incapable of decomposing H_2O_2.

The author found them widely prevalent on vegetable extracts, on the grain of cereals, in milk, in the feces of man and other animals and in the soil. He isolated 17 strains, chiefly from materials at breweries and distilleries. The paper is a detailed description of the cultural and morphological characteristics of these strains.

The classification omits a study of *Lactococci* and includes only the members of the group *Lactobacterium.* These are divided first into flocculating bacteria, and those which do not flocculate during their growth. For most of the species, 20 to 30 days at 30°C. are necessary for the maximum production of acid. Some species produce CO_2 in proportion to the amount of other volatile acid produced. Their injury to yeast during fermentation is due not so much to the amount of lactic acid produced as to the production of formic and acetic acids.

Methods of enrichment of media, and other manipulations for the isolation of these microorganisms are described. The text is illustrated with numerous photographs and sketches showing the morphology of the various species.—S. B-J.

332. *Further Observations on Varieties of Streptococci with Reference to Hemolysis.* B. J. Clawson. J. Infect. Dis., Chicago, 1920, **27**, 368–377.

The method recommended by the Medical Department of the United States Army was found by Clawson to possess no advantages over the plating method on the blood agar plate in determining the occurrence or degree of hemolysis produced by streptococci. The army method failed to show hemolysis when the plates demonstrated hemolysis clearly.

Typical strains of hemolytic streptococcus after growth on artificial medium for 6 months to 3 years may produce colonies which show a green color about the colony similar to that of *Streptococcus viridans.* The appearance of these green colonies is associated with a decrease in the ability of strains to hemolyze as shown by the degree of hemolysis indicated by the army method and the smallness of the size of the hemolyzed zone about the colony on the blood agar plate.

All of 50 strains of hemolytic streptococci tested produced a green discoloration of sheep cells in heated blood, and on blood agar plates, similar to the green color produced by non-hemolyzers.

The green colored substance is shown by spectroscopic investigations to be methemoglobin.

An observation is recorded of the retention of hemolytic power by strains of streptococci for 3 years on meat infusion blood agar.—S. B-J.

333. *Certain Cultural Characteristics of the Gonococcus.* Ernest O. Swartz, Alfred T. Shohl, and David M. Davis. Johns Hopkins Hosp. Bull., Balt., 1920, **31**, 449–452.

After a brief introduction and an historical review the authors discuss the growth of gonococci on culture media, the relation of oxygen tension, the reaction of the medium, moisture and changes in reaction to the growth of the organism, and its reaction to Gram's method of staining. The authors conclude the superior growth of the gonococcus in closed systems under reduced oxygen tension is due to this condition and not to moisture, change of reaction or presence of CO_2, though moisture is necessary to good growth. A reduction in tension of 10 per cent is sufficient to allow optimal growth. In a medium containing uncoagulated protein with an initial reaction between pH 6.6 and pH 8.0 inclusive, the gonococcus will grow luxuriantly under reduced oxygen tentions. In dextrose media the end point for the gonococcus is pH 5.6. None of the cultures studied gave a positive reaction with Gram's stain after repeated transfers.—F. W. H.

334. The Life-Cycle Changes of the So-Called C. Hodgkini and Their Relation to the Mutation Changes in This Species. **Ralph R. Mellon.** J. Med. Research, Bost., 1920, **42**, 61–76.

The author believes that the series of changes occurring in a non-granular bacillus (Corynebacterium Hodgkini) beginning with granular formation and ending with the formation of giant cocci of very diverse morphology is of greater significance biologically than is implied by the term pleomorphism. When these forms are specifically influenced at a certain period in their development, a new type of organism with distinctive characters results.—A. C. E.

335. Beitrag zur Systematik der Paracoli-Bazillen. (Contribution to the Study of the Paracoli Bacilli.) **Paul György.** Centralbl. f. Bakteriol. (etc.), I. Abt. Orig., 1920, **84**, 321–386.

The author defines as belonging to the paracoli group those forms resembling the colon bacillus but not producing gas from lactose. Forty-seven non-motile strains are reported upon. Fermentation of carbohydrates and allied compounds made possible separation into 19 subgroups. Thirteen of these contained a single strain. Ability to coagulate milk was apparently related to ability to "mutate" into a lactose fermenting strain. Most of the strains produced indol. Particular emphasis is laid upon ability to divide the strains into subgroups based upon serologic (agglutination and complement fixation) reactions and types of colonies produced. The two corresponded in general, but did not corrrespond in all cases to the physiologic grouping or morphologic appearance. Agglutinin formation is elicited with difficulty (or not at all) against most strains. Relationship to paratyphoid, dysentery, true colon bacillus and the *Bact. coli mutabile* could not be demonstrated culturally or serologically.—R. E. B.

336. Beiträge zur Kenntnis der Milzbrand- und milzbrandähnlichen Bacillen. (A Contribution to our Knowledge of Anthrax and Anthrax-like Bacteria.) **Gerhard Wagner.** Centralbl. f. Bakteriol. (etc.), I. Abt. Orig., 1920, **84**, 386.

An atypical anthrax bacillus was isolated from the body of a man dying from this disease. It differed from anthrax primarily in its tendency to form teratologic cells, and in the colonies produced.—R. E. B.

NEW SPECIES

337. Leptothrix on the Conjunctiva and in the Meibomian Glands. **S. R. Gifford.** J. Infect. Dis., Chicago, 1920, **27**, 296–309.

A strain of *Leptothrix* was found as the only organism in smears and cultures from the conjunctival sac in a case of recurrent conjunctivitis. This organism was pathogenic for guinea pigs. It grew as a long unbranched thread with subterminal spores, was aerobic, liquefied gelatin, and was easily cultivated on plain media. In staining it was Gram-positive.

Another *Leptothrix* was isolated from a case of chronic disease of the meibomian glands. It, like the first organism, was a Gram-positive, sporogenous, aerobic organism, which grew in long unbranched threads. It was not, however, pathogenic for guinea pigs and was serologically distinct from the first strain. This strain failed to liquefy gelatin.

These observations indicate that within the group called *Leptothrix* there are undoubtedly several varieties of filiform non-branching microorganisms. The literature is reviewed and classification discussed.—S. B-J.

BACTERIAL NUTRITION AND METABOLISM

(See also Numbers, 359, 461, 494 550)

338. Behavior of the Influenza Bacillus in Mixed Culture on Hemoglobin-Free Media. **James Putnam and Douglas M. Gay.** J. Med. Research, Bost., 1920, **42**, 1–7.

Sixteen strains of *B. influenzae* were inoculated in mixed culture with *B. xerosis, B. diphtheriae, B. coli, M. pneumoniae,* and with saprophytic staphylococci on a variety of blood-free media. The influenza bacillus failed to multiply under these conditions.—A. C. E.

339. The Relation between the Number of Bacteria and Acid Production in the Fermentation of Xylose. **J. A. Anderson, E. B. Fred and W. H. Peterson.** J. Infect. Dis., Chicago, 1920, **27**, 281–292.

The production of acid from a 2 per cent xylose medium by *Lactobacillus pentoaceticus* was correlated with bacterial counts which showed the total number of viable organisms in the culture at any time. The acid was estimated by titration of the distillate and of the residue against 0.1 N. barium hydroxide. The volatile acid was found to be acetic acid, the non-volatile acid was lactic. Charts of the data obtained show that the rate of acid production is most rapid during the period of maximum growth of the bacteria. A decline in the rate of growth, after 48 hours, is accompanied by a decreased rate of acidification, although the maximum total acidity in the culture occurs only after several days. Apparently growth of the bacteria precedes the formation of acid in measurable quantities. During active multiplication, however, there is a rapid production of acid. Bacteria which are still viable but no longer multiplying produce a small amount of acid.—S. B-J.

340. *The Fermentation of Xylose by Bacteria of the Aerogenes, Paratyphoid B and Typhoid Groups.* E. B. Fred and W. H. Peterson. J. Infect. Dis., Chicago, 1920, **27**, 539–549.

By analysis of the products of the fermentation of xylose by bacteria of the aerogenes-typhoid group, it is shown that the by-products of the activity of microorganisms considered to be closely related differ quantitatively and qualitatively.

Strains of *B. lactis aerogenes* and *B. paratyphosus* B break up xylose with a rapid evolution of gas. The products of *B. lactis aerogenes* are essentially carbon dioxide, hydrogen and alcohol, with small amounts of volatile acids. Carbon dioxide and alcohol represent about 75 per cent of the sugar consumed. The aerogenes organisms produce acid until the reaction of the medium (yeast, water, peptone, xylose) becomes pH 4.4. Later the reaction reverts to pH 5.

The main products in the fermentation of xylose by *B. paratyphosus* B are formic, acetic, butyric, lactic and succinic acids, ethyl alcohol, carbon dioxide and hydrogen. These products represent about 92 per cent of the original sugar.

The fermentation of xylose by *B. typhosus* is far from complete. Not more than a quarter of the xylose is decomposed. No gaseous products, except small amounts of carbon dioxide, are formed. The chief substances are alcohol, formic, acetic, butyric and succinic acids. The greater part of the fermented xylose is represented by succinic acid.

The amounts of volatile and non-volatile acids were determined by the Duclaux method. A method of sealing the lower arm of a fermentation tube with metallic mercury is described. —S. B-J.

341. *Untersuchungen uber den Pfeifferschen Influenzabazillus während der Grippepandemie 1918–19–20. II. 6. Ueber die Bedeutung des Blutes fur das Wachstum des Pfeifferschen Influenzabazillus.* (*Studies on the Pfeiffer Influenza Bacillus during the Grip Pandemic of 1918–19–20. II. 6. The Significance of Blood for the Growth of the Pfeiffer Influenza Bacillus.*) Otto Olsen. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **85**, 12–27.

Following a resumé of the theories held by various authors relative to the hemoglobinophilic characteristics of the influenza bacillus, the author details the results secured by growing 3 strains of the influenza bacillus on various types of blood agar. A preparation of oxyhaemoglobin when added to agar medium allowed the development of characteristic small colonies of the organism. Giant colonies were formed near colonies of the staphylococcus; methaemoglobin gave practically identical results; haematin prepared in two different ways gave no growth for the influenza bacillus except near colonies of some species of other microorganisms such as *Bacillus subtilis* which favored growth. Haemin gave the same results as haematin. Hematoporphyrin did not permit a growth even in the presence of favoring organisms. The same results were secured with haemocyanin, and the related bilirubin, chlorophyll, pyrrol.

The author concludes that the beneficent effect of hemoglobin and related compound is due to its catalytic action.—R. E. B.

342. *The Fate of Bacteria of the Colon-Typhoid Group on Carbohydrate Media.* O. Ishii. J. Bact., Balt., 1920, **5**, 437–440.

Members of the colon-typhoid group were grown in 1 or 3 per cent sugar broths (glucose, mannitol, lactose, sucrose) and streaked or planted into broth tubes each day and observed for viability. Considerable variation was found for different organisms, *Bact. typhi, Bact. paratyphi* A and B, *Bact. enteritidis, Bact. suipestifer, Bact. coli* are usually non-viable in 3–10 days. *Bact. pyocyaneus* survives nore than 30 days. The reactions of sugar fermentations should not be recorded after the organisms are dead. Changes which take place are due to absorption of CO_2 from the atmosphere.—I. S. F.

343. *A Study of the Action of Eight Strains of Bact. abortivo-equinum on Certain of the Carbohydrates.* C. P. Fitch and W. A. Billings. J. Bact., Balt., 1920, **5**, 469–476.

A comparative study of the fermentative reactions was made with 8 strains obtained from several sources. Check observations on gas production were made by use of inverted vials in heated and unheated one per cent carbohydrate lean-beef broth. The "heated" media were sterilized in the Arnold by steaming for 20 minutes on each of 3 successive days. The "unheated" media were sterilized by filtration through a Berkefeld candle. With respect to lactose and sucrose, the discrepancies in the results of previous workers are attributed to the fermentation of the products of hydrolysis of the sugars during sterilization by heat. *Bact. abortivo-equinum* does not form gas from lactose, sucrose, or raffinose. Variable acidities or alkalinities are obtained with dulcitol in heated and unheated media. Gas formation from other carbohydrates is reported.—I. S. F.

BACTERIOLOGICAL TECHNIC

344. *Practical Methods in the Purification of Obligate Anaerobes.* Ivan C. Hall. J. Infect. Dis., Chicago, 1920, **27**, 576–590.

This paper is a critical discussion of the various methods available for obtaining pure cultures of obligate anaerobes. Examples from the author's experience are used to illustrate the results of the procedures.

Aerobic contaminations or associated aerobes are to be sought for in the initial cultures. When these are not spore bearers, they may be eliminated by selective heating. In some instances, as that of the occurrence of *B. subtilis* in association with an anaerobe, the aerobic bacterium may be eliminated by the use of bacteriostatic dyes, for example, gentian violet. It is advisable to use an enrichment medium of cooked meat, brain, or serum broth, with 0.1 per cent glucose, for the initial cultures.

A comparison is made between surface cultures under anaerobic conditions and deep tube cultures. Surface cultures, using the pyrogallic acid tube method of Wright, yield discrete colonies of anaerobes. These colonies, however, may contain also an associated obligate anaerobe, which remains latent because of an unsuitable degree of oxygen tension. Such mixtures are more readily detected in deep tubes, in which the range of oxygen tension permits the growth of various microorganisms at several levels of the tube. It is concluded that the method of isolation of anaerobes by deep cultivation in tubes of glucose agar is most practical. —S. B-J.

345. A Rapid Method of Pneumococcus Typing. W. W. Oliver. J. Infect. Dis., Chicago, 1920, **27**, 310–314.

For a rapid determination of the type of pneumococcus in the sputum of a patient with pneumonia the author treats the sputum with bile, filters off the fluid, and performs the usual precipitin test on this ox-bile solution of pneumococcal material. A small amount of sputum—about 1 cc.—is placed in a clean test tube, which contains a glass rod. Normal salt is then added, small quantities (0.1–0.2 cc.) being added at a time with vigorous stirring with the glass rod. After from 0.5 to 0.8 cc. of salt solution have been stirred into the sputum, 3 to 5 drops of undiluted ox-bile are added and the mixture thoroughly stirred. The tube is then placed in a water bath at 45 to 48°C. for 10 to 20 minutes. The fluid is then filtered or cleared by centrifuging. Of the filtrate or centrifugate 0.3 to 05. cc. of clear fluid are pipetted into each of 3 small tubes. To the first tube is added 1 drop of Type I pneumococcus anti-serum, to the second tube is added 1 drop of Type II pneumococcus anti-serum, and an "equal quantity of Type III anti-serum is added to the third tube." A clouding appears almost at once in the tube in which a positive reaction occurs. Pneumococcus typing can be done by this method within one-half hour after the receipt of the sputum. The results of the method were found to parallel those of the usual cultural and serological methods of pneumococcus typing. —S. B-J.

346. "Color Standards" for the Colorimetric Measurement of H-ion Concentration pH 1.2 to pH 9.8. Leon S. Medalia. J. Bact., Balt., 1920, **5**, 441–468.

The author has devised a simple set of color standards for the measurement of H-ion concentration of culture media, bacterial cultures, blood, urine and other fluids. The standards are made up by adding appropriate (specified) amounts of the indicator to two sets of tubes (7 in each set), one containing an acid designed to bring out the acidic color of the indicator and the other an alkali to bring out the alkaline color. By a simple method of overlapping the acid and alkali series complete color ranges of pH are obtainable. The standards are simple, easily prepared and are calculated to give complete sets in the range pH 1.4–pH 9.6.

With these standards, acid and alkali production by bacteria have been measured. It has been found possible to add the indicators of Clark and Lubs' series to the media before sterilization (with the exception of methyl red which is not thermostable under these conditions). The presence of the indicator in the medium during incubation facilitates the reading of changes of pH during cultivation.—I. S. F.

347. État organisé des colonies bactériennes. (The Organization of Bacterial Colonies.) R. Legrou and J. Magrou. Ann. de l'Inst. Pasteur, Par., 1920, **34**, 417–431.

"Histologic sections" of the wrinkled colonies of the cholera vibrio were prepared according to the following technic:

The colony to be studied, together with a small thin layer of the subjacent agar, is lifted with a delicate spatula from the plate. This is fixed in a mixture composed of equal parts of formol and 80 per cent alcohol for 24 hours. The block is then dehydrated in alcohol and embedded in paraffin. Care is taken at all times not to touch the colony and to protect it against violent agitation of the fluid around it. Sections are then cut, fixed on slides with gelatin or albumin, and the paraffin dissolved off. The section is treated with methyl alcohol and placed face up in a Laveran-Mesnil jar and stained for 1 minute with a mixture of:

Eosinate of methylene blue	7.0 grams
Eosinate of toluidin blue	1.5 grams
Toluidin blue	0.5 gram
99 per cent methyl alcohol	490.0 cc.

After the stain has acted for 1 minute, 4 cc. of neutral distilled water are added, and the mixture allowed to act for 10 minutes. The slide is then washed in ordinary water, differentiated with a solution of orange tannin in neutral distilled water. Differentiation is considered to be complete when the agar becomes blue. The section is dehydrated in ethyl alcohol, cleared in toluol and mounted in cedar oil.

Sections thus treated show areas of typical bacteria in a matrix of granules, chiefly staining with eosin. The structure of the apparently highly organized colony is shown in colored illustrations. It is exceedingly complex, having an appearance not unlike the glandular tissue of animals.—S. B.-J.

348. Pallidafärbung in dickem Tropfen. (*Pallida Staining in Thick Drops.*) **Johann Saphier.** München. med. Wchnschr., 1920, **67**, 1047–1048.

A drop of serous exudate is placed in a grease-free slide, dried, and passed three times through a flame. The preparation is fixed for 1 minute in: Formalin, 20.0, glacial acetic acid, 1.0, and distilled water, 100. Then put several drops of: tannic acid, 5.0, phenol, 1.0, and distilled water, 100, on the preparation and heat to steaming (10 to 20 seconds). Rinse in running water and stain as desired with any bacteriological stain like methyl violet. Wash, dry carefully, preferably high over a flame.—B. C.

FERMENTATION INDUSTRIES

349. Further Studies on the Deterioration of Sugars in Storage. **N. Kopeloff, H. Z. E. Perkins and C. J. Welcome.** J. Agric. Research, Wash., 1921, **20**, 637.

The authors continue the studies outlined in a previous paper (J. Indust. & Eng. Chem., **5**, 860) and offer further evidence that the numbers of microorganisms in stored sugar may be used as an index to its keeping quality.

"From 3 to 6 bags of Cuban raw sugars, each of 10 different marks, with moisture ratios varying from 0.18 to 0.50, were stored under normal conditions in a large warehouse and were analyzed chemically and bacteriologically at the beginning and after four and eight weeks, respectively. There was a loss of polarization in most of the sugars at the end of each period, which was generally accompanied by a gain in reducing sugars and moisture content.

"There was a decided increase in the number of microorganisms per gram especially during the first four weeks, which could be correlated, within certain limitations, with deterioration. . . . . A large initial infection or rapid multiplication of microorganisms was responsible for an increase in deterioration."

It was shown that the use of superheated steam in the centrifugal reduces the number of organisms more than 90 per cent and may eliminate deterioration if the moisture ratio is properly controlled.—G. J. H.

MYCOLOGY

(*See also Numbers 337, 484, 485*)

350. Higher Basidiomycetes from the Philippines and their Hosts, I. **O. A. Reinking.** Philippine J. Sc., Manila, 1919, **15**, 479–490.

A report of a survey of the fungi of the Philippines is given.—M. W. C.

351. Beitrag zur Zytologie der Schizomyceten. (*A Contribution to the Cytology of the Schizomycetes.*) **B. Schussnig.** Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **85**, 1–12.

A careful study has been recorded by the author of an organism which he terms *Bacterium caviae* found in the gut of a guinea pig. The organism is unusually large; 5–8 μ in length and 1–2 μ in width. It produces a single polar spore. The author was unable to secure growth upon artificial media. The study was made entirely from smears prepared by the moist method used by protozoölogists and usually stained by Heidenhain's or Giemsa's method. The life history of the organism is as follows: The spore contains two nuclei which upon germination fuse in the new cell. This nucleus gradually disappears and gives way to a chromidial apparatus which performs the function apparently of the nucleus during the remainder of the cell life. This diffuse distribution of chromatic substance remains until formation of a spore. When the cell is about to sporulate a nucleus is formed which divides into two daughter cells, one remains as the vegetative nucleus in the mother cell and the other passes into the spore anlage. This then divides to form two nuclei.—R. E. B.

352. Versuche zum Nachweise von Schimmelpilzen im Mageninhalt der Leiche und der Entwicklungshemmung oder-förderung von Schimmelpilzel durch Mageninhalt als Nahrbodenzusatz. (*Study upon the Recognition of Molds in the Stomach Contents Post Mortem and on the Inhibition of Stimulation of Growth of Molds by Stomach Contents as an Addition to Nutrient Media.*) **H. v. Meyenburg.** Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **84**, 554.

A study was made of the ability of stomach contents taken from cadavars to stimulate or inhibit growth of the fungus *Aspergillus fumigatus* In general it was found that such material added to agar would permit the growth of this organism. The practical bearing of this is pointed out.—R. E. B.

SOIL BACTERIOLOGY

353. Nodule Bacteria of Leguminous Plants. **F. Löhnis and R. Hansen.** J. Agric. Research, Wash., 1921, **20**, 543–556.

The writers have made a comparative study of 11 strains of the legume nodule organism, each from a different host plant, and a further comparison was made with *Bacillus radiobacter* Beijerinck. They conclude that there are two distinct groups of the legume bacteria, one peritrichic, the other monotrichic, differing also in cultural characteristics. The peritrichic group, which grows relatively fast on agar plates and causes marked peptonization of milk, produces nodules on the roots of clover, sweet clover, alfalfa, vetch, pea, navy bean, lupine, black locust, *Amorpha* and *Strophostyles*. The monotrichic group, which grows very slowly on agar plates and causes scarcely any marked change in milk, produces nodules on the roots of cowpea, soybean, peanut, beggarweed, *Acacia*, *Genista*, and *Cassia*.

The peritrichic legume organism is apparently closely related to *B. radiobacter*, which seems to be regularly present in legume nodules and, outgrowing the nodule organism on the plates, is often mistaken for the latter. It bears more resemblance to the peritrichic legume bacteria than the latter do to the monotrichic group, but is to be distinguished by its brown growth on potato. The writers consider *B. radiobacter* to be closely related to the coli-aerogenes group of bacteria, and think the nodule bacteria should therefore be placed close to this group of gas-forming organisms, although they themselves show no gaseous fermentation of sugars.—H. J. C.

354. Notes on the Flagellation of the Nodule Bacteria of the Leguminosae. I. V. SHUNK. J. Bact., Balt., 1921, **6**, 239–246.

The writer discusses briefly the literature relating to the flagellation of this group of bacteria, showing the confusion that exists. He then reports the results of quite an extensive investigation made with 41 strains of legume bacteria, each obtained from a different species of legume. The flagella preparations are made at various ages of the cultures used, and in each case the age of the culture is stated.

The writer concludes that there are two groups of the organisms, one peritrichic, the other monotrichic. In this he agrees with the above paper by Löhnis and Hansen and confirms the earlier findings of Hansen (see Abstract 127, Vol. 4). The paper is accompanied by camera lucida drawings of flagella preparations from each of the 41 strains. The monotrichic strains show very distinctly the characteristic attachment of the flagellum as often at a "corner" or side of the cell as at the exact pole. In no case was any difference found in the type of flagellation on organisms from plants of different species of any genus. From 8 genera of legumes (*Vicia*, *Trifolium*, *Medicago*, *Melilotus*, *Robinia*, *Pisum*, *Phaseolus*, and *Lathyrus*) the organisms were peritrichic; from 15 genera (*Albizzia*, *Cassia*, *Falcata*, *Baptisia*, *Cracca*, *Soja*, *Meibomia*, *Vigna*, *Arachis*, *Stylosanthes*, *Clitoria*, *Pueraria*, *Dolicholus*, *Lespedeza*, *Stizolobium*) the organisms were monotrichic. Ten of these genera (*Trifolium*, *Melilotus*, *Medicago*, *Vicia*, *Pisum*, *Phaseolus* in one group; and *Vigna*, *Soja*, *and Arachis* in the other) were also studied by Löhnis and Hansen; and by reference to the above abstract it will be seen that for these 10 genera the agreement is complete.

The writer also discusses the relation of age to the flagellation. He shows that to obtain flagella it is necessary to use cultures of the proper age; but wherever he has been able to obtain flagella preparations of monotrichic organisms at different ages, he has never found more flagella present in the older than in the younger cultures.—H. J. C.

355. Bidrag till frågan om stallgödselkvävets nitrifikation i åkerjorden. III. (*Contribution to the Question of Nitrification of Manure-Nitrogen in Soil. III.*) CHR. BARTHEL AND N. BENGTSSON. Meddel. No. 211, Centralanst. försöksv. jordbruksområdet, Bakt. avdelningen, No. 23, Stockhokm, 1920.

The earlier papers on this subject, already reviewed in this journal (Vol. 3, No. 1806; Vol. 4, No. 585), dealt with the nitrification of manure-nitrogen in mineral soils. The present investigation, however, concerns nitrification in a pure humus soil (lowland moor) of decided acid character (pH = 5.4), but nevertheless with a lime content of 3.56 per cent CaO (dry weight). The investigation was carried on with: (1) soil alone; (2) soil with 0.2 per cent ammonium sulfate; (3) soil with 0.2 per cent ammonium sulfate and 2 per cent CaO (as $CaCO_3$); (4) soil with 4 per cent manure; (5) soil with 4 per cent manure and 2 per cent CaO; (6) soil with 4 per cent manure and 0.2 per cent ammonium sulfate; (7) soil with 4 per cent manure and 0.2 per cent ammonium sulfate and 2 per cent CaO; (8) soil with 2 per cent CaO. Two similarly prepared series were run. The moisture content was kept constant at about 65 per cent. The following results were obtained:

1. Nitrification took place as vigorously in this soil without addition and with ammonium sulfate added as in the previously studied neutral mineral soils, although in the humus soil the initial pH-value was only 5.4.

2. After 6 months, in one series 86 per cent of the ammonia nitrogen was nitrified, while in the second series not only all the original ammonia nitrogen but also all the nitrogen of other forms was nitrified. This vigorous nitrification, which did not occur in the mineral soils, is probably due to the fact that the addition of ammonia (in the manure) brings about a lowering of the hydrogen ion concentration and thereby also an increased nitrification of the humus nitrogen. Special experiments point to this explanation.

3. In this humus soil, as in the mineral soils, the addition of lime has no influence on the nitrification of manure.

4. In spite of the high lime content of the humus soil, the addition of lime worked very favorably on the nitrification of ammonium sulfate, and also on the nitrification of the natural nitrogen compounds of the soil.

5. Ammonium sulfate was nitrified distinctly more rapidly in this acid humus soil than in the previously investigated mineral soils. This probably is due to the fact that the humus soil contains appreciable quantities of buffer substances, especially calcium compounds.

6. After the addition of ammonium sulfate to the humus soil the hydrogen ion concentration increased steadily, up to pH 4.0, where it remained constant. In spite of this high hydrogen ion concentration, the nitrification continued constantly without hindrance.—H. J. C.

356. Symbiotic Nitrogen-fixation by Leguminous Plants, with Special Reference to the Bacteria Concerned. Roy Hansen. Sci. Agric., Gardenvale, P. Q., 1921, **1**, 59–62.

A general, and more or less popular discussion of the subject, with a brief summary of the work done by the author in association with the late Dr. Burrill, published in 1917 as Bulletin 202 of the Illinois Agricultural Experiment Station. This work showed 11 distinct types of legume organisms, and gave no evidence of the possibility of symbiosis between any of them and non-leguminous plants.—H. J. C.

357. Nitrogen Fixation by Cowpeas and Nodule Bacteria. A. L. Whiting and W. R. Schoonover. Soil Sci., Balt., 1920, **10**, 411–420.

The necessity for determining the chemistry of nitrogen fixation by legumes and nodule bacteria forms the basis for this reasearch. The authors first established the advisability of using seeds of uniform rather than random weight in order to obtain the lowest possible variations in nitrogen content. Emphasis is also directed toward the importance of properly washing the sand used in such tests. The method recommended is to wash the sand with hot nitrogen-free distilled water until no traces of nitrates or acid are found. Only sterile nitrogen-free nutrients were added. The Kjeldahl method for nitrogen determinations was employed.

The first appearance of nitrogen fixation as detected in the inoculated cowpeas in nitrogen-free sand was 9 days after planting; at 11 to 12 positive fixation was found which increased at 13 to 14 days.

The process of nitrogen-fixation appears to be related to the development of plants, i.e., the more rapidly the plant grows the more nitrogen it fixes. A rapid increase occurs soon after the third leaf (first real leaf) is developed, which was found to be 19 days after planting By 26 days nitrogen was fixed to the extent of three times the amount that was contained in the seeds at planting. These preliminray studies in the mechanism of nitrogen fixation did not indicate that oxidation and reduction were concerned in the process.—N. K.

358. Der Verlauf der Nitrifikation bei Gegenwart von Permutit sowie der Karbonate verschiedener alkalischer Erden. (The Course of Nitrification in the Presence of Permutite and Carbonates of Various Alkaline Earths.) L. Wichers. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1920, **52**, 1–9.

The zeolites, especially permutite, have no influence on nitrification in solution, if enough $CaCO_3$ is present. A favorable action of the zeolite is found in sand cultures. The beneficial action of alkaline earth carbonates upon nitrification can be arranged in the following series: Ca, Ba, Sr, Mg. It is interesting to note that $MgCO_3$ commonly used in nitrification studies exerts the least favorable influence, due to the toxic action of magnesium nitrate on the nitrifying bacteria.—S. A. W.

359. Torf als Energiequelle für Stickstoffassimilierende Bakterien. (Peat as a Source of Energy for Nitrogen-fixing Bacteria.) E. W. Schmidt. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1920, **52**, 281–289.

The cell membrane of recent sphagnum moss and young sphagnum torf is acted upon by cellulose decomposing bacteria, whereby decomposition products are produced which can be utilized as a source of carbon by azotobacter. Torf moss membranes are attacked with relative difficulty; this resistance against the action of cellulose bacteria can be decreased by preliminary treatment of torf, such as boiling, steaming, grinding. Torf hydrolysed with dilute hydrochloric acid, and then neutralized, offers optimum conditions for the growth of azotobacter.—S. A. W.

360. Morphologische und Physiologische Untersuchungen über Bodenbewohnende Mykobakterien. (Morphological and Physiological Investigations on the Mycobacteria of the Soil.) Karl Vierling. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1920, **52**, 193–214.

A morphological and physiological study of 23 strains of Mycobacteria isolated from the soil. For isolation, the writer used the method of Sohngen, who found that the Mycobacteria can utilize benzine, petroleum, paraffin oil and paraffin as the only source of carbon. Among the physiological properties, color of growth on agar and on potato, acid fastness, amylase and urease production, and reduction of nitrates to nitrites are noted. The rôle of the Mycobacteria in the soil probably consists in the decomposition of organic matter. The Mycobacteria are related to the Actinomycetes, probably forming a link between this group of organisms and the true bacteria.—S. A. W.

361. Chemosynthesis with Sulfur as a Source of Energy. M. W. BEIJERINCK. Proc. Koninklijke Akad. v. Wetenschappen, Amsterdam, 1920, **22**, 899–908.

"Some of the common denitrifying bacteria, such as *B. denitrificans* and *B. Stutzeri* (these names taken in a broad sense) and probably some other species, may occur under two physiologically different modifications, which are hereditarily constant, when their feeding conditions remained unchanged. One form, the autotrophic, is adapted to an inorganic medium (sulphur- or thiosulphate calcium-nitrate) and shows chemosynthesis: the other, the heterotrophic form requires organic food. They may be compared to the oligotrophic and the polytrophic condition of the nitrate ferment. Intermediate forms feebly denitrifying in an inorganic medium, also occur, hence the autotrophy may be gradually lost.

"The heterotrophic forms preserve the power of denitrification with organic food.

"The nitrite ferments of the ammonium salts are also related to hereditary modifications with the character of saprophytes, living on organic food and unable to oxidize ammonium salts.

"Great changes in the nature of the food may thus be the cause of hereditary modifications of certain factors and this seems to throw some light on the causes which underlie ontogony."—L. V. E.

362. A Comparison of Inoculated and Uninoculated Sulphur for the Control of Potato Scab. W. H. MARTIN. Soil Sci., Balt., 1921, **11**, 75–84.

These experiments are concerned with the importance of the oxidation of sulphur in the presence of sulphofying organisms, i.e., the determination of the success or failure to control scab in potatoes. Inoculated and uninoculated commercial sulphur was applied to Sassafras and Penn loams growing Irish Cobbler potatoes. When harvested the crop was divided into three classes: clean, salable, and unsalable scabby.

Soil samples were taken before the sulphur was applied as well as at digging time to a depth of 6½ inches at intervals of approximately 15 feet. The hydrogen ion concentration determination of water extracts was performed by the Gillespie method.

The addition of sulphur to the soil usually leads to an increase in soil acidity due largely to the oxidation of sulphur by sulphofying microorganisms. Where these organisms are absent it is necessary to supply them in order that sulphur may be properly oxidized. Inoculated sulphur gave better control of scab than similar amounts of sulphur uninoculated and there is indication that smaller amounts of inoculated sulphur may be used to obtain the same results as larger quantities of uninoculated sulphur.

The hydrogen ion exponent values of soil samples taken from the plots treated with inoculated and uninoculated sulphur were lower than the corresponding values from the check plots. In most instances this increase in acidity was accompanied by a corresponding decrease in the number of unsalable scabby tubers.—N. K.

363. Bakteriologische Versuche. (Bacteriological Experiments.) B. HEINZE. Landw. Jahrb., Berl., 1920, **55**, 139–184.

A continuation of the work of Hiltner and Rahn on the influence of drying upon the bacterial activities of a soil. Drying results in a decrease of bacterial numbers of 40 to 70 per cent followed by an increase after the soil is again moistened. Various theories are suggested in explanation of the favorable effect of drying upon bacterial activities. The use of solutions for quantitative study of bacterial activities (Remy's method) is severely criticized; the use of the soil itself for this purpose is to be preferred.

Further studies on nitrogen-fixation by azotobacter and legume-bacteria are reported.—S. A. W.

364. Untersuchungen über chemische und bakteriologische Umsetzungen im Boden. (Investigation upon the Chemical and Bacteriological Changes in the Soil.) F. MÜNTER. Landw. Jahrb., Berl., 1920, **55**, 62–138.

A report on the influence of mineral salts on the physical, chemical, and bacteriological changes in the soil. It was found that, the heavier the soil, the higher must be the water content, to bring about an equally strong decomposition of the organic nitrogenous substances. At a low moisture content, the rapidity of ammonia formation increases with the lightness of the soil, nitrate formation takes place only in light soils; at a medium moisture content, it is alike in all soils; at a high moisture content, the highest nitrate content is found, after a time, in sandy soils, while the nitrates formed in heavy soils are decomposed. Sandy soils, with a continually high water content, show only 9 per cent loss, loam and clay soils lose 32 per cent. The decomposition of ammonium sulfate and nitrate formation increase with the increase in soil moisture and heaviness of soil; at a low water content, the reverse relationship holds true, ammonia transformation and nitrification increasing with the lightness of the soil. An addition of organic matter increases ammoniacal decomposition, but the nitrate content decreases due to the transformation of nitrogen into protein or, at a continually high water content, to the loss of free nitrogen. Organic matter increases the decomposition of nitrate, when this is used as a fertilizer.

The second part of the article deals with a detailed study of the metabolism of 7 species of *Actinomyces* isolated previously from the soil.—S. A. W.

DAIRY BACTERIOLOGY

(*See also Number 331*)

365. The Relationship between the Hydrogen-ion Concentration and the Bacterial Content of Cows' Milk. E. W. Schultz, Alberta Marx and H. J. Weaver. J. Dairy Sc., Balt., 1921, **4**, 1–6.

The authors briefly describe the preparation of standard solutions to cover pH values from 6.8 to 4.6, the preparation of brom-thymol blue indicator solutions and the preparation of collodion dialyzer sacs. The hydrogen ion concentration of the milk was determined by putting 1 cc. of the milk to be tested in a collodion sac and lowering it into a test tube of the same size as those used for the standard solutions and containing 2 cc. of normal (0.8 per cent) salt solution of neutral reaction. After dialysis is completed the hydrogen ion concentration of the normal salt solution is determined by comparison with tubes containing the standard solutions.

Bacterial counts were made immediately after the pH readings were completed, by the agar plate technic recommended in the 1916 report of the American Public Health Association. The milk was mixed herd milk from a variety of sources. When the results were plotted it was found that there was a general correlation between increased hydrogen-ion concentration and increased numbers of bacteria. At a pH value of 6.6 the bacterial count was found to run high, averaging 16,000,000 per cc. At a pH value of 6.5 this had increased to an average of 100,000,000 per cc., though at these pH readings there was no detectable acid taste. The acidity was first detected by taste at a pH of about 6.0. The authors feel that this technic might be made useful in quickly determining the quality of milk.—R. S. B.

366. Kasungversuche mit milch von Obst- und Obstresterfutterung. (*Cheese Studies with Milk from Cows Fed with Fruit and Fruit Refuse.*) A. Peter. Bern. Molkereischule in Rutti-Zollikofen. Jahrb., 1918, **33**, 24.

During a series of experiments cows were fed fruit and fruit skins and experimental cheeses were made from the milk to determine the effect of the feed upon the flavor of the cheese.

Of 29 cheeses made under varying conditions and using the milk produced from the fruit, all were found to be of inferior quality and to have developed undesirable odors and flavors. —G. J. H.

367. Ueber Versuche betreffend die bakteriologische und milchwirtschaftliche Seite der Süssgrünfutterfrage. (*A Study Concerning the Bacteriological and Practical Effect of the Sweet-Green-Fodder Question.*) R. Burri. Schweiz. Milch. Ztg., 1918, **38**, 39.

A discussion of the effects of different groups and numbers of organisms found in the various stages of decomposing fodders. As many as 320,000,000 organisms per gram were found.

In a general outline of the effects of the green fodders upon milk and milk products it is concluded that the field offers many problems in relation to development of odors, etc., in the milk by-products.—G. J. H.

368. Über angeschimmelte Butter. (*Moldy Butter.*) F. W. J. Boekhout and J. J. Ott de Vories. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1920, **52**, 39–45.

Hormodendron cladosporoides Fres. (Syn. *Cladosporium herbarum*) was isolated from moldy butter.—S. A. W.

369. The Laboratory as an Aid to Milk Quality. G. K. Cooke. Dairy & Stock Ranch, 1921, **4**, 19–20.

The value of the laboratory in milk inspection is discussed. The author believes that the laboratory is an aid to inspection but should not supplant it. Many illustrations are given of the efficiency of the laboratory in detecting and locating failures to observe proper precautions in handling the milk.—L. A. R.

370. The Accuracy of Bacterial Counts from Milk Samples. R. S. Breed and W. A. Stocking. J. Dairy Sc., Balt., 1921, **4**, 39–72.

This is a condensed account of work already noted from another source (see Abstract No. 1578, Vol. 4 of this journal).—R. S. B.

COMPARATIVE PATHOLOGY

(*See also Numbers 343, 394, 521, 522, 559*)

371. Progress of Cooperative Tuberculosis Eradication Work. J. A. Kiernan. Vet. Med., Chicago, 1921, **16**, 25–29

The author discusses in a general way results obtained in the cooperative tuberculosis eradication work. Three years ago the number of accredited herds in America could be represented by two figures; on November 1, 1920, there were 4283 accredited herds and 24,616 herds which had passed one successful test in the process of accreditation. In addition to these groups there are under supervision approximately 40,000 herds. Interesting data are offered as to the relative value of the various tuberculin tests. The writer states also that lack of funds is the greatest obstacle confronting this campaign.—W. L. B.

372. *Etiology of Acute Gangrenous Infections of Animals: A Discussion of Blackleg, Braxy, Malignant Edema and Whale Septicemia. Studies of Pathogenic Anaerobes I.* Hilda Hempl Heller. J. Infect. Dis., Chicago, 1920, **27**, 385–451.

The detailed cultural studies of pathogenic anaerobes reported in this article embrace the observations and analysis of a large number of strains from animal infections and the literary reviews present a condensation and critical correlation of an enormous amount of material.

The author discourages the attempt to differentiate clinically between malignant edema and blackleg. On the basis of bacteriological studies, blackleg is found to be due to *B. chauvoei*, and malignant edema to organisms of the *Vibrion septique* group. Cattle are subject to spontaneous infection by organisms of the blackleg group and somewhat less frequently, by organisms of the *Vibrion septique* group.

Sheep are subject to spontaneous infection by organisms of the *Vibrion septique* group and less frequently by organisms of the backleg group Both types are called braxy, blackleg and malignant edema.

Horses are subject to infection by the *Vibrion septique* group, usually as a consequence of a wound. Horses are also subject to infection by the organisms of the edematiens group. True blackleg in the horse has probably never been demonstrated.

Hogs are subject to infection by microörganisms of the *Vibrion septique* group, and have never been shown to suffer from spontaneous blackleg.

Infections in animals by organisms of the edematiens group and by *B. welchii* are notably rare.

Procedures to be followed in immunization of animals against these infections should be based upon the group affinities of the anaerobic organisms infecting animals of the particular district in which immunization is proposed.—S. B-J.

373. *The Dissemination of Anthrax Infection Through Industrial Sources.* A. Eichhorn and A. L. Edmunds. J. Am. Vet. M. Ass., Wash., 1921, **58**, 278–288; Vet. Med., Chicago, 1921, **16**, 29–35.

The authors state that the handling of anthrax hides in tanneries has been recognized as a source of danger to the employees coming in contact with them, and statistical data available prove that a large proportion of the anthrax cases in human beings develops among tannery workers and among laborers employed in loading and unloading hides. Some of their conclusions are as follows:

1. The drainage water from tanneries handling foreign hides constitutes a source of danger for polluting streams with anthrax infection. In at least two instances in the past 5 years, have new anthrax districts been created by such tanneries in the United States and Canada.
2. Either Federal or State authorities should be empowered to compel tannery owners to adopt such means as would prevent the contamination of streams with anthrax infection. The soaking of hides by either the Seymour Jones or Schattenfroh methods will effectively control the anthrax infection in hides. These methods, however, are effective only if consistently carried out.
3. Where no precautions are taken to guard against continuous pollution of the drainage water, and where animals have access to the stream where such drainage water flows, they should be vaccinated not only in the routine manner, but they should also be periodically re-vaccinated in order to confer upon them the maximum of immunity.
4. If even the necessary precautions are taken by the tanneries, the animals would have access to the land previously known to have been infected by tanneries and should be regularly vaccinated. If anthrax should develop in such districts, the outbreaks should be controlled by the usual approved sanitary measures.—W. L. B.

374. *Potassium Iodide in Congenital Goiter.* H. Welch. Vet. Med., Chicago, 1921, **16**, 26–27.

The writer states that the use of potassium iodide as a preventive of congenital goiter in domestic animals has become widespread. Results secured from proper administration of this drug have shown 100 per cent prevention. The author discusses briefly the influence of feeds and feeding on goiter, and says experimental feeding will have to be done in order to establish the minimum iodine content of the thyroid of the mother for the production of normal young.—W. L. B.

375. *Beitrag zur Aetiologie und feinen Struktur des Rhinoskleroms. (Contribution to the Etiology and Fine Structure of Rhinoscleroma.)* G. Agagna. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **85**, 38–42.

Regaud's method for the recognition of mitochondria makes possible definite recognition of the Frisch bacilli in sections of scleromatous tissues. This method gives constant results when other methods fail.—R. E. B.

376. *Beitrag zur Diagnose des Stutenabortus durch die Agglutinationsprüfung des Mutterserums. (The Diagnosis of Equine Abortion by the Agglutination Test of the Dam's Serum.)* Paul Glander. Deutsche tierärztl. Wchnschr., 1920, **28**, 237–241.

Some of the more important conclusions reached by Glander were: (1) That normal sera may agglutinate the paratyphoid bacillus of equine abortion in dilution of 1:300; (2) that sera from geldings show a lower agglutination titre than do mares' sera; (3) that younger animals show lower agglutinating sera than older ones; (4) agglutination in dilution higher than 1:300 means infection; (5) thirteen aborting mares gave positive results while 3 yielded negative results. The agglutination results indicate that the causative bacteria of equine abortion are more closely related to paratyphoid B than to the Gärtner group.

For diagnosis, the bacteriologic examination of the fetus in many cases cannot be dispensed with.—J. T.

377. *Zum Nachweise der Abortus infektion bei Rindern durch die Ausflockungs-Reaktion nach Sachs-Georgi.* (*Flocculation Reaction of Sachs-Georgi in the Detection of Abortus Infection in Cattle.*) Sachweh and Rösner. Deutsche tierärtztl. Wchnschr., 1920, **28**, 345–349.

The cases in which these workers found distinct negative results with agglutination but a positive Sachs-Georgi reaction are so few that they consider the difference of no practical value. They, however, claim that in atypical agglutination results and as a control test the Sachs-Georgi reaction has a place in the diagnosis of infectious abortion of cattle.—J. T.

378. *Intravenöuse Behandlung der Maul und Klauenseuche mit Trypaflavin.* (*The Intravenous Injection of Trypaflavin in Foot and Mouth Disease.*) Mayer Pullmann. Deutsche tierärztl. Wchnschr., 1920, **28**, 288.

The author treated 117 cows, 4 oxen, 7 hogs and 50 goats by this method and claims that there follows a reduction of temperature after 3–10 hours. Vesicles on the feet and udder appear less often and soon dry up; appetite returns sooner than in untreated animals, and the gravity of the internal manifestations diminishes.

Other workers (Schermer, ibid., p. 394) have not obtained equally good results with trypaflavin.—J. T.

379. *Die Bösartige Form der Maul und Klauenseuche und die Milch.* (*The Malignant Form of Foot and Mouth Disease and the Milk.*) H. Miessner. Deutsche tierärztl. Wchnschr., 1920, **28**, 321–323.

According to the findings at the Hygienic Institute in Hanover, acute multiple myocarditis, together with aggravated intestinal catarrh, is the principal cause of death in foot and mouth disease. The principal changes are grayish-white linear and punctiform spots on the heart muscle. The author notes two cases, one in which pigs and the other in which calves were affected. Miessner believes that the virulence of the virus is increased in the milk. The difficulty in obtaining coal, wood and soap prevents the proper cleaning of utensils and heating of the skim milk and whey and this is one of the reasons for the spread of malignant foot and mouth disease.—J. T.

380. *Neue Erkenntnisse zur Ätiologie der Maul und Klauenseuche.* (*New Ideas Regarding the Etiology of Foot and Mouth Disease.*) Jos. Bohm. Deutsche tierärztl. Wchnschr., 1920, **28**, 382–384.

The clinical picture and post mortem findings in the malignant form of foot and mouth disease show a strong resemblance to adrenalin poisoning, i.e., degeneration of the heart muscle and hemorrhages in the fore and hind portion of the intestinal tract.

According to the author's view, the outset of the disease is attended by production of adrenalin as a protective measure (resulting in salivation). If this increased hormone production in the adrenals does not cease at the proper time, there results an adrenalin poisoning with hyperglycemia and acetone accumulation in the blood. This is followed by an inhibition of pancreatic secretion resulting in the lesions of the gastrointestinal canal and nutritional disturbance followed by death.—J. T.

381. *Ein durch Spirillen bedingstes Infektiöses Verkalben.* (*Infectious Abortion Produced by Spirilla.*) Axel Thomsen. Deutsche. tierärztl. Wehnschr., 1920, **28**, 405–407.

A record is given of 4 cases in which a spirillum has been demonstrated microscopically in material from the fetuses. In two cases, culture of the spirillum was obtained, in both instances from the lungs only, even though, on microscopic examination, the organisms were found elsewhere. In these cases, the 4 aborting cows gave negative results to the agglutination test for infectious abortion.—J. T.

382. *Dermatose contagieuse (Impetigo contagieux).* (*Contagious Dermatitis.*) R. Van Saceghem. Ann. de méd. vét., Brux., 1920, **65**, 75.

The existence of dermatitis contagiosum in the animals (especially ruminants) of Congo, Africa, has been known for some years, but the work heretofore has not been sufficient to establish the disease as a clinical entity. The specific organism is a fungus, *Dermatophilus congolensis.* It can be observed in scrapings from the skin, but only after careful masceration and staining with basic dyes. The filaments appear as irregular, rarely ramifying segments, 1–8 μ in diameter, and a variable length which may reach 1 mm. Spores are usually observed, which when free resemble cocci. Its cultivation so far has not been accomplished successfully. The lesions produced may be local or general and consist of small, red, elevated areas, which soon become matted over with crusts and hairs. The location may be in region of neck, back, head, legs, etc. Warm, damp seasons seem to be especially favorable to the development and spread of the infection. Treatment is also described, the more important being prophylaxis, and local applications of sodium arsenite 3 parts to 100, coal tar, or phenol ointment 1–10. The condition is aggravated by use of soaps, washing and rubbing.—D. C. B.

383. A Trypanosome Associated with a Fatal Disease in the Carabao. Frank G. Haughwout and Stanton Youngberg. Philippine J. Sc., Manila, 1920, **16**, 77–85.

A description is given of a trypanosome found in the blood of a carabao, which eight days after the second of two immunizing injections to rinderpest, developed unusual clinical symptoms of so severe a character that the animal was killed. In blood smears made at autopsy were numerous trypanosomes which were much larger and of a type different from *Trypanosoma evansi*, the only trypanosome of importance in the Philippines. In general it resembled *Trypanosoma theileri* more closely than any other of the larger trypanosomes. From the material available for study however, the authors are not prepared to place it definitely in this series. A careful report of a cytological study of the organism is given.—M. W. C.

384. A Leprosy-like Disease in the Lungs of a Mexican Parrot. W. B. Wherry. J. Infect. Dis., Chicago, 1920, **27**, 293–295.

The lungs of a Mexican parrot contained many tubercle-like nodules about 1 mm. in diameter. Smears from these showed acid-fast bacilli, and in sections the bacilli were found to be within epithelial cells, lying in dense masses and at all angles. The sections resembled the lesions of human or rat leprosy. Cultures on rabbit blood agar and glycerol potato under aerobic and anaerobic conditions at 37°C. to 24°C. for 6 months remained sterile. This was though to exclude avian tuberculosis. No inoculation experiments are reported.—S. B-J.

385. Mineral Requirements in Animal Foods. A. T. Peters. Vet. Med., Chicago, 1921, **16**, 27–28.

The need of animals for mineral matter is more urgent than the average person suspects. The author relates his experience in the use of minerals in the treatment of various paralyses occurring frequently in farm animals, and also in treatment of bovine infectious abortion.—W. L. B.

386. Bijdrage tot de kennis der Microsporie, in het bizonder bij de Geit. (Contributions to the Knowledge of Microsporosis, especially in the Goat.) C. Bubberman. Proefschrift, Veeartsenijkundige Hoogeschool, Utrecht, 1920, 1–19.

A discussion of microsporosis closing with the following conclusions.

1. Jumnapari and Montgomery goats suffer spontaneously from a microsporosis caused by a microsporum of the human type.

2. The breed of goats indigenous to West Java is susceptible to this microsporum.

3. The microsporum mentioned is closely related to *Microsporum andouini* and may provisionally be designated as *Microsporum andouini* var. *hemitragi*.

4. The microsporum concerned is derived from the head of children. In the region along the Jumna River microsporosis is said to occur in children.—L. V. E.

387. Über Paralyse der Lammer. (Paralysis of Lambs.) H. Magnusson. Deutsche tierärztl. Wchnschr., 1920, **28**, 297–300.

Magnusson describes a progressive paralysis in lambs from 4 weeks to 3 months old, kept under excellent hygienic conditions. The disease begins with incoordination of movements of the hind quarters. Temperature, appetite and defecation normal. The skin of the hind quarters responds to needle prick. Pattelar reflex is distinct. Paralysis spreads rapidly to the front quarters. Post mortem is negative. The author thinks the disease is the same as described by Gaiger as renguera, which appeared in the Peruvian Andes.—J. T.

388. Bijdrage tot de kennis van enkele Darmprotozoen der Huisdieren in het bijzonder bij Schaap en Varken. (Contribution to the Knowledge of some Intestinal Protozoa of the Domestic Animals, especially of Sheep and Swine.) J. B. Douwes. Proefschrift, Veeartsenijkundige Hoogeschool, Utrecht, 1921, 1–62.

In this paper the author discusses the general characteristics and the classification of protozoa, laboratory technic, parasitic flagellates and ciliates, ameba and coccidia. He reviews existing knowledge and states his own observations. The article closes with a bibliography.—L. V. E.

389. Influence of Feeding on Hog Cholera Breaks. Robert Jay. Vet. Med., Chicago, 1921, **16**, 25–26.

The author reports on a number of experiments in which attempt was made to determine the influence of feed as a predisposing factor in the so-called hog cholera breaks. The writer is of the opinion that the physiological chemist must determine the cause of these breaks by feeding experiments on vaccinated hogs and by determining the progressive changes which take place in the blood and tissues of the hog during this condition of anaphylaxis. There is less to be looked for in the attempts at isolation and identification of bacteria associated with the virus of hog cholera.—W. L. B.

390. Porcine Abortion. A. T. Kinsley. Vet. Med., Chicago, 1921, **16**, 41–42.

The following is a part of the report of the committee on differential diagnosis of porcine diseases, which was presented at the meeting of the U. S. Live Stock Sanitary Association. Abortion in swine is not confined to any particular breed. The condition occurs in sows of all ages, although some veterinarians are of the opinion that gilts are more subject to abortion than aged sows. The specific cause of abortion in swine has not been identified. A variety of germs have been isolated from the aborted fetuses and uterine discharges such as *B. coli*, *B. bipolaris*, *B. suipestifer*, various pathogenic cocci, streptococci and less frequently representatives of the paratyphoid group. According to investigations of J. Traum, Good and Schlegel, the causative organism of porcine abortion is physiologically and biologically identical to the *Bact. abortum* Bang, and has been designated as *B. abortus suis*.—W. L. B.

PARASITIC DISEASES

(*See also Numbers 386, 388*)

391. The Intestinal Animal Parasites Found in One Hundred Sick Filipino Children. Frank G. Haughwout and F. S. Horrilleno. Philippine J. Sc., Manila, 1920, **16**, 1–73.

A study was made of 100 Filipino children, varying in age from 7 months to 13 years, to determine the percentage that were parasitized. The children were all patients in the Philippine General Hospital.

Of those under 1 year, parasites were present in 66.6 per cent.

Of those between 1 and 2 years, parasites were present in 73.6 per cent.

Of those between 2 and 3 years, parasites were present in 100 per cent.

The distribution of parasites is as follows:

	CASES	TOTAL INFECTIONS
With protozoa	33	41
With protozoa alone	2	—
With helminths	80	138
With helminths alone	49	
Mixed protozoal and helminthal infections	31	
Spirochaeta eurygyrata alone	8	
"Blastocystis" alone	1	

At least 5 separate stool examinations, extending over 7 to 10 days, were made upon each patient. At each examination 3 cover glass preparations of the fresh material were carefully studied, 5 slides were fixed and stained for subsequent study, and at least, 1 gram of the stool, including samples from different parts, was concentrated by the method of Cropper and Row. A complete description of all details of the procedure is given.

The paper includes a detailed discussion of each parasite identified. its incidence in each group of children, and its possible relation to the pathologic conditions found.

In the series, no protozoon of proved pathogenicity was found—a fact, which suggests an apparent immunity of children to *Entamoeba histolytica* and *Balantidium*. *Spirochaeta eurygyrata* was found in 61 per cent of infections.

The question is raised as to the possibly serious character of infestations with *Trichuris* and *Ascaris*.

Helminthal infections were restricted to the Nematoda.

Hookworm was present in 12 per cent of series.

The question is raised in regard to eosinophilia in all the helminthiases.

Endolimax nana and *Dientamoeba fragilis* are reported for the first time from the Philippine Islands. *Eutrichomastix* is provisionally reported.—M. W. C.

392. Higher Basidiomycetes from the Philippines and their Hosts, II. Otto A. Reinking. Philippine J. Sc., Manila, 1920, **16**, 167–179.

A continuation of the report given in Philippine J. Sc., Manila, 1919, **15**, 479–490.—M. W. C.

393. Protozoölogic and Clinical Studies on the Treatment of Protozoal Dysentery with Benzyl Benzoate. II. Treatment of a Case of Acute Balantidiosis; Recovery; Death from Other Causes; Failure to find the Parasites in the Bowel Lumen and Gut Wall at Autopsy. Frank G. Haughwout and Elias Domingo. Philippine J. Sc., Manila, 1920, **16**, 633–646.

A very severe case of balantidiosis, complicated by infections with hookworm and *Trichuris*, was treated with benzyl benzoate. The treatment was begun upon the twenty-third day of the disease and was continued for 24 days. The first doses were 10 drops of a 20 per cent alcoholic solution given in water 3 times a day. This dose was increased to 15 and later to 20 drops.

Marked improvement in the clinical symptoms began during the first 24 hours of treatment. During the first few days of treatment, the stools changed markedly, becoming soft and feculent. Balantidia, which were present in immense numbers in the feces before treatment, showed a tendency to disappear up to the eighth day of treatment, when there was a sudden increase. Further treatment resulted in a complete disappearance of the organisms upon the seventeenth day, after which time they did not reappear.

After death, which was due to causes not related to the infection with *Balantidium coli*, no balantidia were found in the intestinal tract although extensive search was made under conditions most favorable for the discovery of the organisms.—M. W. C.

394. Uses and Limitations of Santonin. M. C. Hall. Vet. Med., Chicago, 1921, **16**, 50–52.

The author gives the chemical and physiological properties of santonin. The plant grows in northern middle Europe and in Asia; the principal source of our santonin supply being a firm in Turkestan, which firm has been out of operation since some time during the war; a fact which accounts to some extent for the present high price of santonin. The method of administration of the drug as well as the varieties of worms in which santonin is indicated as a vermifuge are described in detail. The place of santonin in dog, swine, sheep, cattle, horse and poultry practice is discussed extensively. The writer points out the interesting fact that our domesticated animals are not in some respects as tolerant to santonin as man.—W. L. B.

TROPICAL DISEASES

(*See also Number 402*)

395. A Study of a Case of Yaws (Frambesia Tropica) Contracted by an American Soldier in France. J. F. Schamberg and J. V. Klauder. Arch. Dermat. & Syphilol., Chicago, 1921, **3**, 49–75.

A case is reported and previous literature discussed. The *Spirochaeta pertenue* is more difficult to stain than *Spirochaeta pallida.*

Testicular lesions only could be produced in rabbits with *Spirochaeta pertenue.* The lesions are similar to those from syphilitic infection. The authors state that the most reliable laboratory differentiation between yaws and syphilis is the production of chancre on the eyebrow of a monkey and the subsequent production of the lesion of frambesia on the other eyebrow.—R. D. H.

396. Experimental Transmission of Yellow Fever. P. Perez Grovas. J. Am. M. Ass., Chicago. 1921, **76**, 362.

Guinea pigs injected with blood from patients taken during the third or fourth day of illness contracted yellow fever. *Leptospira icteroides* was obtained in pure culture from the blood of yellow fever patients and from infected guinea pigs. The experimental disease has been transmitted in indefinite series by means of inoculation. The virulence of the organisms was increased for guinea pigs by repeated passage. The disease was also produced in guinea pigs by injecting pure cultures.—P. G. H.

397. Essais d'inoculation du paludisme au chimpanzé. (*Attempts to Inoculate the Chimpanzee with Malaria.*) F. Mesnil and E. Rubaud. Ann. de l'Inst. Pasteur, Par., 1920, **34**, 466–479.

Two chimpanzees were injected intravenously on several occasions with human blood which contained *Plasmodium vivax.* A light transitory infection, associated with a brief paroxysm of fever and the appearance of the malarial parasites in the blood was obtained with one of these animals.

These chimpanzees did not contract malaria when they were bitten by mosquitos infected with *Plasmodium praecox.*—S. B-J.

398. Malignant Malaria in a Baby—Recovery. W. G. Marsden. Practitioner, Lond., 1920, **104**, 393–394.

Case history of a child 7 months old is given, with a heavy infection of benign and malignant tertian malarial parasites.—C. P. B.

399. A Case of Acute Mania Associated with Plasmodium vivax Infection. Frank G. Haughwout, Pedro T. Lantin and Ricardo Fernandez. Philippine J. Sc., Manila, 1919, **15**, 563–569.

Report is given of a chronic case of malaria in which cerebral symptoms resulting in death occurred eight days after an initial treatment with Roentgen rays for splenomegaly of malarial origin. *Plasmodium vivax* was present in the blood in small numbers on the day of onset of cerebral symptoms and on subsequent days. *Plasmedium falciparum* was not present. The case is considered of unusual interest because of the rarity of cerebral symptoms in an infection with *Plasmodium vivax.*—M. W. C.

400. Pyrexie mortelle á allure spéciale causée par un flagellé a Guyane francaise. (*Fatal Pyrexia with Special Features Caused by a Flagellate in French Guiana.*) M. Léger. Ann. de l'Inst. Pasteur, Par., 1920, **34**, 481–496.

In French Guiana, the author saw 2 patients with a peculiar febrile disease, which could not be satisfactorily diagnosticated. In the first case, the patient had remittent fever, lasting more than 6 months, without great general debility. The fever was not attributable to malaria, as shown by the absence of parasites in the blood and by the inefficacy of quinine therapy. The spleen and liver were slightly enlarged and the patient was slightly jaundiced. There was no albumin in the urine. He died during a paroxysm of fever. The second patient had a similar clinical course. At autopsy, the author found in the blood, spleen and liver the flagellates which are described in this paper.

Five forms of the parasite were seen in various preparations stained with Giemsa's stain. These are described as follows:

1. Elongated forms with free flagella. The protoplasmic body measured 3.5 μ long by 1 μ in width. The extremities were rounded, the posterior more tapered than the anterior,

and was continued as a flagellum as long as the body. The median part contained an oval nucleus and behind this a blepharoplast in a vacuole. The flagellum did not arise from this blepharoplast. Longer forms, with longer flagella and several blepharoplasts were also seen.

2. Round or oval forms, 5–7 μ in diameter, with one or two flagella. The protoplasm is vacuolated and granular, with single or double nuclei and variable blepharoplasts.
3. Round forms of the same character, but without flagella.
4. Oval forms without flagella, containing 18 chromatin bodies, each in a vacuole.
5. Voluminous irregular degenerative forms.

The author thinks that this flagellate belongs in the genus *Trypanosoma*, and designates it as *Trypanosoma malignus*.—S. B-J.

401. *Plague-like Organisms in the Wild Rats of Sao Paulo, Brazil.* W. G. **Smillie**. J. Infect. Dis., Chicago, 1920, **27**, 378–384.

The difficulty of differential bacteriological diagnosis, which may arise in studies of rats in a plague-infected district, is illustrated by this account of the occurrence of organisms of the Pasteurella group in wild rats in Brazil. Three strains of Gram-negative, bipolar-staining, non-motile, plague-like bacilli, were isolated from normal appearing rats at São Paulo. These organisms closely resembled *B. pestis*, and were highly pathogenic for guinea pigs and rabbits. They differed from *B. pestis* only in their failure to grow on McConkey's sodium taurocholate medium, and in that they failed to infect guinea pigs when rubbed on the skin or nasal mucous membranes. They were not agglutinated by anti-plague serum, and anti-plague serum did not protect animals against infection with these organisms. On the basis of these negative results the author concluded that the organisms were representatives of the Pasteurella group, but were not *B. pestis*.—S. B-J.

MEDICAL ENTOMOLOGY

(*See also Numbers 574, 575*)

402. *Zur Systematik der einheimischen Stechmücken. 3. Vorläufige Mitteilung Die Männchen. (Systematic Studies on the Endemic Mosquitoes. 3. Preliminary Contribution: The Males.)* **Fritz Eckstein**. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **84**, 223–240.

Keys and descriptions are given to the males of the various species of mosquitoes endemic in Germany.—R. E. B.

403. *Eine Agar-Agar fressende Milbe. Züchtung des Tyroglyphus longior (Gerv.) auf Agar. (A Mite Which Feeds on Agar-Agar. Cultivation of Tyroglyphus longior (Gerv.) on Agar.)* W. **Lénárd**. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **84**, 539.

The author reports that it is possible to grow the mite *Tyroglyphus longior* (Gervais) on bouillon-peptone agar in the presence of bacteria, but that the mite does not multiply on sterile agar.—R. E. B.

PROTOZOÖLOGY

(*See also Number 383*)

404. *A Report on the Occurrence of Intestinal Protozoa in the Inhabitants of Great Britain with Special Reference to Entamoeba histolytica.* C. C. Dobell, A. H. Campbell, T. Goodey, R. C. McLean, M. M. Nutt and A. G. Thacker. Privy Council, Medical Research Council, Special Report Series, No. 59, London, 1921. 71 pages. Published by His Majesty's Stationery Office. Price 2 shillings net.

After it became known that carriers of *Entamoeba histolytica* are not uncommon, and that persons returning to England from the war area were frequently carriers of that organism, it became evident that it was advisable to search for carriers among persons who had not been out of England.

Individual cases of amebic dysentery in persons who had never been out of England have been reported as far back as 1862. Matthews and Smith and their coworkers at Liverpool (1916–1919) reported their findings of *Entamoeba histolytica* and other intestinal protozoa in the stools of persons who had never been out of England.

The present study was carried out under the direction of Dobell, in 5 localities: Birmingham, by T. Goodey; Brighton, by A. G. Thacker; Bristol, by A. H. Campbell; Leeds and Sheffield, by M. M. Nutt; and Reading, by R. C. McLean.

From the Liverpool reports and the reports of the present work, examinations of stools of 3146 persons are tabulated, as follows:

CASES	TOTAL NUMBER	PROTOZOA					
		E. h.	E. c.	E. n.	I. b.	G. i.	Ch. m.
Liverpool (4 series)	2137	80	302	87	7	182	19
Six new series	1009	27	269	59	1	111	74
Grand total	3146	107	571	146	8	293	93
Per cent		3.4	18.1	4.6	0.25	9.3	2.9

In discussing the results, Dobell says that a series of cases examined once apiece may be expected to disclose about one-third of the infections actually present. When each case is examined 3 times, between one-half and two-thirds of the actual number of infections will have been detected.

From this, it is considered that the percentages given in the table, since they are based for the most part on one examination per case, are much lower than the actual incidence of infection; and an estimate of the true incidence of infection is given, as follows:

Protozoon	*Estimated percentage incidence*
Entamoeba histolytica	7.0–10.0
Entamoeba coli	36.0–54.0
Endolimax nana	9.0–13.0
Iodamoeba bütschlii	0.5– 0.75
Giardia intestinalis	18.0–27.0
Chilomastix mesnili	6.0– 9.0

The different intestinal protozoa are discussed in detail. Infection with any of the intestinal protozoa presists for a long time—in most cases for life. Some of the series show a higher percentage of infections with *Entamoeba histolytica* in adults than in children—possibly from accumulation of infection over the prolonged period of exposure; but some of the series showed a higher percentage of infection in children. It is estimated that 7 to 10 per cent of the population harbors *Entamoeba histolytica.*

Entamoeba histolytica infection occurs in males and females with equal frequency.

In the Liverpool series, the incidence of infection with *Entamoeba histolytica* among miners was high (12.8 per cent); and among the inmates of asylums, 9.7 per cent in one asylum and 4.2 per cent in another asylum were infected.

The cases of infection with *Entamoeba histolytica* were from England, Scotland, Wales and Ireland.

The persons found infected with *Entamoeba histolytica* did not give histories of past diarrhea or dysentery more commonly than did the uninfected.

It is estimated that not less than 50 per cent of the general population of the British Isles is infected with *Entamoeba coli.* Matthews and Smith found 45.9 per cent of the inmates of one asylum infected with *Entamoeba coli* on a single examination.

Based on the examinations, it is estimated that 9 to 13 per cent of the population is infected with *Endolimax nana;* but it is considered that this estimate is probably too low. Dobell's figures show that probably not less than 50 per cent of the soldiers returning from abroad are infected with this organism.

Iodamoeba bütschlii occurs in Britain, but is rare—apparently in not over about one per cent of the inhabitants.

Dientamoeba fragilis occurs in persons who have never left Britain; but, as the cyst is unknown, the organism is found only in soft stools examined fresh.

Giardia intestinalis is more commonly found in the stools of children than in the stools of adults; but this may mean merely that the organism is more readily found in the stools of children, or that the infection is richer in children. Miss Nutt found *Giardia* in the stools of 6 of 25 children examined, the youngest positive case being 3 weeks old.

It is estimated that *Chilomastix mesnili* exists in 6 to 9 per cent of the British population: Matthews and Smith found 23.2 per cent of infection in the inmates of an asylum.

As the cyst of *Trichomonas hominis* is unknown, this organism is found only in fresh stools; so the apparent absence of the parasite in these series does not prove that it is so uncommon.

No case of infection with *Balantidium coli* was found.

The intestinal protozoa are spread from man to man by the ingestion of cysts passed in the stools of infected persons. Matthews and Smith found that, within certain families, infections are more common than in the general population of children. This, and the high rates of infection found among miners and inmates of asylums, indicates that persons closely associated for considerable periods, under poor sanitary conditions, are apt to acquire the infection from one another.

Entamoeba histolytica occurs indigenously in the population of France, Holland, and Germany.

This high percentage of infection with *Entamoeba histolytica* in the population of Britain is of interest to the sanitarian and the physician. *Entamoeba histolytica* and *Balantidium coli* are facultatively pathogenic. There is as yet no conclusive evidence to prove that any of the other intestinal protozoa of man are pathogenic; while there is much evidence, on the other hand, to show that they are, in the majority of cases, harmless. *Entamoeba histolytica* is an obligatory tissue parasite, and causes erosion or ulceration of the host's intestine; but the injury of the intestine is not usually sufficient to give rise to any clinically recognizable symptoms.

There is no evidence that there are "pathogenic" and "non-pathogenic" strains of *Entamoeba histolytica;* all strains being tissue parasites, and so capable of being "pathogenic" to a susceptible host; but it does not follow that all strains are equally harmless to all hosts. Amebic dysentery is the consequence of an incompatibility between the amebae and their host; it is an abnormal or "diseased" condition for both.

It appears that *Entamoeba histolytica* has parasitized man for a long time, as evidenced by its frequency and wide-spread distribution, and by the fact that its normal host is the "healthy" carrier. *Entamoeba histolytica* has become well adapted to man, and man well adapted to *Entamoeba histolytica;* and it may be supposed that particular races of amebae have become adapted to particular races of man; the races of amebae in one country becoming adapted to the races of man in that country. But, if men go from one country to another, and acquire the amebae of their new country, it is possible that the amebae, not adapted to life in this race of man, may cause dysentery more readily than in the host to which they are adapted.

From this work it is evident that *Entamoeba histolytica* is an old inhabitant of the British Isles; and, while it may cause disease, it is usually harmless—at all events, in a population in which it has been long established. It has apparently caused little trouble in the past, and is not likely to cause more in the future. Its prevalence, therefore, need not be regarded with alarm. But, since *Entamoeba histolytica* is so wide-spread, and does cause disease in some individuals, it is necessary for physicians to take it into account in dealing with cases of dysentery, chronic diarrhea, ulcerative colitis, and similar intestinal conditions, hepatitis, liver abscess, and similar liver conditions, in which *Entamoeba histolytica* may be the causative agent.—E. R. W.

405. *Recherches sur le Spirochaeta icterohemorrhagiae, Inado et Ido.* (***Researches on the Spirochaeta icterohemorrhagiae of Inado and Ido.***) M. Gieszczykiewicz. Ann. de l'Inst. Pasteur, Par., 1920, **34**, 763–774.

The author studied a strain of *Spirochaeta icterohemorrhagiae* to determine the conditions under which the globular bodies occurred in cultures of this microorganism and to investigate the biological significance of these forms. Globular bodies or granules appear in the cultures at temperatures below 20°C. and above 37°C., which are unfavorable to the growth of the spirochete. Coccoid forms also appear in old cultures in hypertonic solutions and in acid or alkaline media. Under the influence of these agents, the spirochetes lose their normal form and become converted into round bodies.

These coccoid forms were found to be no more resistant to heat and chemicals than the normal forms of the spirochete. Hence they are thought not to be spores or resistant forms of the organism. It was apparently impossible to obtain viable cultures from old cultures containing only these globular forms, and the emulsions of granules did not infect guinea pigs. Since these forms are not resistant to injurious agents, and seem also to be deprived of vitality, the author is of the opinion that they are simply degeneration forms, and without significance as propagative forms in the life cycle of the spirochete.—S. B-J.

406. *La flagellose des Eurphorbes.* (***The Flagellosis of the Euphorbias.***) C. Franca. Ann. de l'Inst. Pasteur, Par., 1920, **34**, 432–465.

The flagellates which inhabit certain plants of the genus *Euphorbia* are chiefly the species *Leptomonas davidi*. This is a long narrow parasite, twisted 2 or 3 times around its long axis at the posterior part, has a spherical blepharoplast 1.5μ from the anterior end, an ellipitcal nucleus with a central caryosome, and a single delicate flagellum, which originates at the blepharoplast. Round oval and doubled forms are seen also—of the type called *Herpetomonas*. The classification of this parasite is discussed in detail, and it is differentiated from *Herpetomonas* and *Crithidia*. In Portugal, the insect, *Stenocephalus agilis* was found to be the vector of this parasite. The morphology of the parasite in the insect's body is described. The insect, which is exclusively a phytophage, sucks the juice of *Euphorbia*, but does not bite man. Hence it cannot be considered an intermediary host as far as animal infections with *Leptomonas* are concerned. Although this parasite is closely related to the trypanosomes and to *Leishmania*, attempts to infect mice and rabbits with *Leptomonas davidi* were not successful. When more material is available, the author will inoculate animals with the forms of *Leptomonas* which occur in the salivary glands of *Stenocephalus*.—S. B-J.

407. *Sur l'évolution de Sarcocystis muris.* (***The Developmental Stages of Sarcocystis muris.***) N. Marullaz. Ann. de l'Inst. Pasteur, Par., 1920, **34**, 547–552.

Sarcocystis muris, after ingestion by mice, may pass through the following stages:

1. Some of the parasites, after becoming fixed to the cells covering the villi of the intestine, undergo complete karyokinesis. The products of this division, free or included in the cells of the host, fall into the lumen of the intestine where they continue to multiply for about 10 days. A number of the free parasites in the intestinal canal are expelled with the dejections and may thus serve to propagate the infection. The author, however, has never seen the cysts described by L. Negre.

2. Others of the ingested parasites, after having undergone the primary karyokinesis in the epithelial cells of the intestine, wander into the lymphatic spaces. The completion of their division seems to occur during the period of their passage from the intestine to other viscera (liver and spleen). "Daughter spores" penetrate striated muscle, and multiply there, forming rose-bodies, in which may be seen the beginning of "Miescher's tube."

In the course of various experiments the author has never seen any forms which confirmed Crawley's ideas upon the fecundation of spores included within the cells of the intestinal mucosa.

Attempts to infect mice by intraperitoneal or intramuscular injections of the parasites failed.—S. B-J.

408. *Kultur von Flagellaten in festen Nährböden.* (*Cultivation of a Flagellate in Solid Media.*) L. Gózony. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **84**, 565–566.

It proved possible to cultivate in agar-agar to which had been added rabbit kidney and without the presence of any blood, certain flagellates, and to secure isolated flagellate colonies. The organism studied was from the blood of the owl. The medium was the usual peptone gelatin which had been liquefied and pieces of fresh sterile rabbit kidney included. This was then inoculated with the flagellate and cooled. After a week the shake culture showed small, round, scarcely visible colonies which after an additional week grew somewhat larger and showed a diameter up to 1 mm. These colonies in the gelatin were observed to be made up of flagellate rosettes.—R. E. B.

EPIDEMIOLOGY

409. *The Epidemiology of Hemolytic Streptococcus Carriers, Based on a Study of Subgroups.* J. E. Walker. J. Infect. Dis., Chicago, 1920, **27**, 618–628.

In this paper the problem of the epidemiology of streptococcus carriers is approached through a study of the subgroups of that type of microorganism. The subdivisions of hemolytic streptococci are based upon the fermentation of carbohydrates, according to Holman's classification, which defines *Streptococcus infrequens*, *Streptococcus pyogens*, and *Streptococcus anginosus*. Serological differentiations were not studied. The investigation was carried out at Columbus Barracks, Ohio, in March, 1920, where the permanent personnel numbered 1300, and where about 40 to 50 recruits were received each day. Throat cultures were made at intervals from these men, and the streptococci in the air of wards were collected by exposing blood agar plates in these places. Ten per cent human blood in meat infusion agar was used for the plates, and horse serum water with Andrade's indicator with lactose, mannit and salicin in the fermentation tests.

Among the permanent personnel of the fort, 20 per cent were carriers of hemolytic streptococci; among the recruits 17 per cent on their arrival, and 16 per cent at the time of their departure. Thirty-four per cent of those with tonsils, hypertrophied tonsils or other abnormality of the throat carried hemolytic streptococci. The permanent personnel of the post showed a higher percentage of carriers of the anginosus strains, while only a few of the recruits carried organisms of this type. *Streptococcus infrequens* occurred in 57 per cent of the cases of measles. The common type for both recruits and permanent personnel was *Streptococcus pyogens*.

The plates exposed in wards during the day, when patients, and other persons were moving about the ward, showed a settling of hemolytic streptococci per square meter as follows: in medical ward, 144; venereal ward, 236; surgical wards, 39–131. The organisms isolated from the air were the same varieties as those harbored by the patients and carriers.—S. B-J.

410. *On the Occurrence of Hemolytic Streptococci in the Stools of Scarlet Fever.* W. B. Moody and E. E. Irons. J. Infect. Dis., Chicago, 1920, **27**, 363–367.

Typical hemolytic streptococci were isolated from the feces of 30 per cent of 85 scarlet fever patients. They occurred in the feces at irregular intervals, with no definite relation to the age of the patient, character of the stool, duration or intensity of the illness. The number of colonies was small in comparison with those of other organisms, such as *B. coli*, staphylococci and green producing streptococci. Six of 11 strains of hemolytic streptococci isolated from the stools of scarlet fever patients were agglutinated or opsonified by immune serum from a sheep injected with hemolytic streptococci obtained from the throat of an early case of scarlet fever.—S. B-J.

411. *Report on Investigation of Typhoid Fever Epidemic at Greeneville, Tennessee.* C. N. Harrub. Pub. Health Rep., Wash., 1921, **36**, 72–80.

A survey of the water supply system of Greeneville, Tennessee, revealed the fact that the water was grossly poluted and had probably been the responsible agent for typhoid epidemics extending over a period of 8 years. Installation of a new liquid chlorine plant, filtration of the water, removal of all surface privies and cess pools and connection with the sewer of all houses on sewered streets are recommended to aid in stamping out the disease.—I. A. B.

412. *The Disease-Carrier Problem in the Philippine Islands.* Concha Brillantes. Philippine J. Sc., Manila, 1920, **17**, 109–117.

A survey of the carrier problem shows that carriers of typhoid, cholera, and diphtheria all occur in the Philippines. However, carriers of typhoid bacilli do not seem to play an appreciable part in the spread of typhoid fever. Carriers of diphtheria and cholera, on the other hand, constitute the main factors in the spread of these diseases.—M. W. C.

PUBLIC HEALTH REGULATION

413. Relationships in Medical and Public Health Work. HUGH S. CUMMING. South. M. J., Birmingham, 1921, **14**, 26–31.

A forecast of the logical future development of preventive medicine.—J. H. B.

414. Unity of Organization for Public Health Activities. C. C. PIERCE. Texas State J. M., Fort Worth, 1921, **16**, 377–380.

A plea for the cooperation of private health agencies and state boards of health with the United States Public Health Service acting in a coördinating and advisory capacity.—J. H. B.

DISINFECTION AND GROWTH INHIBITION

415. The Thermal Death Point in Relation to Time of Typical Thermophilic Organisms. W. D. BIGELOW AND J. R. ESTY. J. Infect. Dis., Chicago, 1920, **27**, 602–617.

By thermal death point in relation to time is meant the length of time at different temperatures necessary to destroy completely a definite number of spores in a medium of known hydrogen-ion concentration. The suspensions of spores in broth, meat juice, fruit juice or salt solution were immersed in small soft glass tubes in an oil bath kept at the desired temperature by an electric furnace controlled by a thermoregulator. After the period of heating, the tubes were cooled in 20 seconds by immersion in an ice-bath. Precautions to avoid contaminations, careful control of the number of spores used, the temperature to which they were exposed and of the hydrogen-ion concentration of the fluid in which the spores were suspended were maintained in all experiments.

It was found that the time necessary to destroy a known suspension of known hydrogen-ion concentration decreases as the temperature increases. For example, 200,000 spores per 1 cc. of a culture of thermophile No. 26 were destroyed in 1,320 minutes at 100°C., 690 minutes at 105°C., 225 minutes at 110°C., 84 minutes at 115°C., 23 minutes at 120°C., 8 minutes at 125°C., 3.5 minutes at 130°C., 1.5 minutes at 135°C., and 1 minute at 140°C. A table is given showing the time necessary to destroy by heat the spore of 19 thermophilic bacteria suspended in corn juice with pH 6.

The hydrogen-ion concentration of the medium influences the time necessary to destroy a known suspension of spores at a given temperature. In more acid fluid (pH 4.5) the time required to kill spores at a given temperature is less than in a less acid fluid (pH 6.5).

The larger the number of spores present in a suspension the longer the time necessary to destroy them by a given temperature. These results are obviously applicable to the process of sterilization of canned foods.—S. B-J.

416. The Testing of Germicidal Substances Against the Gonococcus. DAVID M. DAVIS AND E. O. SWARTZ. J. Infect. Dis., Chicago, 1920, **27**, 591–601.

The authors describe a practical and reliable method of making germicidal tests with the gonococcus. Success in this method has as a primary requisite the means of growing large cultures of the gonococcus in a solid medium, as was perfected by Swartz. Thick emulsions of the organisms were treated with the germicidal chemical for a definite length of time, usually 20 minutes. The organisms were then washed by centrifuging them through salt solution several times to free them from the drug to which they had been exposed, and then the whole mass was spread on a slant of ascitic or hydrocele fluid agar. The various stages of the procedure, with a description of the controls used, are set forth in detail. Protocols of the actual experiments, on which the general discussion is based, are not presented in this paper. The method, as outlined herein, gave reliable results and served as means of measuring accurately the action of germicidal agents upon suspensions of gonococci in test tube experiments.—S. B-J.

417. Investigations of the Germicidal Value of Some of the Chlorine Disinfectants. F. W. TILLEY. J. Agric. Research, Wash., 1920, **20**, 85–110.

The paper discusses experiments regarding the efficiency of chlorine antiseptics as general disinfectants, using "Chloramin T" (sodium-toluene-sulphon-chloramid), Dakin's Solution (NaOCl), eusol (HOCl), and chlorine. The cultures used in the series of experiments were *Staph. aureus*, *B. pyocyaneus*, *B. typhosus*, *B. tuberculosis* and anthrax spores.

For use as general disinfectants in the presence of large amounts of organic matter, it was noted that due to the enormous diminution in germicidal value, on the addition of organic matter, and the injurious effects upon fabrics, metals, etc., the chlorine compounds, as a class, are not suited for use under the usual conditions of general disinfection.

If compared on the basis of weight, Chloramin T was found to be less efficient than the other compounds used, whereas if the comparison was made on the basis of available chlorine, it was more efficient against *Staph. aureus*, much less efficient against *B. pyocyaneus* and approximately equal in efficiency against *B. typhosus*.

The experiments against *B. tuberculosis* indicated that the chlorine disinfectants were "worth very little so far as the organism is concerned," and against anthrax spores the action was not as rapid as has previously been supposed.

The addition of ammonia to the solutions was found to increase greatly the germicidal value and to prevent to some extent the depreciation in value when organic matter was added.

The author also noted a decided selective action of the compounds used upon the various cultures.—G. J. H.

418. *Ueber Bakterientransport durch den Dampf bakterienhaltiger Flüssigkeiten.* (*Transportation of Bacteria by the Steam of Fluids containing Bacteria.*) H. Dold. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt., Orig., 1920, **84**, 558–562.

The author notes that it is customary always to regard steam at 100°C. as sterile. He describes an apparatus for testing the truth of this belief. Fluids containing various sporulating and non-sporulating organisms were studied. The vapor rising from a fluid containing spore-producing bacteria was found to contain viable spores of these organisms in some cases as long as 2 minutes. This is particularly noteworthy if the spore-holding material is brought to a boil very quickly. Probably there is danger only during the first few seconds or minutes after the beginning of the bubbling.—R. E. B.

419. *Untersuchungen über die desinfizierende Wirkung einiger neuer Silberpräparate.* (*Studies on the Germicidal Action of Some New Silver Preparations.*) Bernhard. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **85**, 46–63.

The composition and germicidal action of argochrom, cholezal protargol and kollargol were studied. The methods of Krönig and Paul, in which staphylococci are dried on garnets, were used and the relative value of the disinfectants determined. When dissolved in distilled water, argochrom was found to be most powerful. It was noted that the silver content of the preparation is no criterion of its antibacterial power. The presence of sodium chlorid greatly diminishes the disinfective value of these compounds, causing that of argochrom almost completely to disappear.—R. E. B.

420. *Ueber die batkerizide Wirkung des Urotropins.* (*The Bactericidal Action of Urotropin.*) Toshinobu Ohira. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **85**, 63–68.

The author concludes, after a study of the action of urotropin upon the colon bacillus, typhoid bacillus, *Staphylococcus aureus*, *Staphylococcus albus* and *Proteus vulgaris*, that this compound does not have any special bactericidal or growth-inhibiting action upon bacteria. In ammoniacal fermentation of urine the growth of bacteria is interfered with by the alkalinity of the medium.—R. E. B.

WATER AND SEWAGE BACTERIOLOGY

421. *Zur bakteriologischen Untersuchung des Trinkwassers.* (*On the Bacteriological Study of Drinking Water.*) J. J. de Waal. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1920, 52, 10–18.

A comparative study is made of media used for bacteriological investigations of drinking water. Bouillon-gelatin at 20°C. and bouillon-agar at 37°C. can be used together, and river water-gelatin in special cases. For the demonstration of *B. coli*, two media are used: (1) acid nutrient bouillon containing 0.5 per cent lactose, and 10 mgm. neutral red for every 100 cc. of medium; (2) pegallac, a medium consisting of distilled water with 3 per cent camebile, 1 per cent Witte peptone, 10 per cent lactose and 2.5 per cent litmus solution.—S. A. W.

FOOD BACTERIOLOGY

(*See also Number 547*)

422. *The Distribution of the Spores of B. botulinus in Nature.* K. F. Meyer and J. C. Geiger. Pub. Health Rep., Wash., 1921, **36**, 4–6.

A study of the occurrence of *B. botulinus* in the soil of certain parts of the Pacific Coast. —I. A. B.

HEALTH BOARD LABORATORY METHODS

423. *Vergleichende Untersuchungen über die Methoden von Herman und Ziehl-Neelsen zur Färbung von Tuberkelbazillen.* (*Comparison of the Methods of Herman and of Ziehl-Neelsen in Staining the Tubercle Bacillus.*) Elisabeth Kongsted. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **84**, 513–516.

The author has compared the results secured in 1200 samples of sputum stained both by the Herman and the Ziehl-Neelsen methods. He concludes that the preparations stained by the method of Herman give better results. Details of the technic, contrast stains, etc., are discussed briefly.—R. E. B.

424. *Une nouvelle methode de coloration du bacille de Koch.* (*A New Stain for the Tubercle Bacillus.*) Durupt. Presse med., Par., 1921, **29**, (Suppl.), 5.

The methods described are German war "ersatz" procedures, which the author has checked by the classic method, and found accurate. They are equally suitable for sections.

Slow method. Stain 12 hours in the cold with carbol-fuchsin. Wash thoroughly in water. Decolorize completely in 10 per cent sodium sulphite. Wash, and counterstain with methylene blue.

It is almost impossible to over-decolorize by this method; 20 minutes is the maximum time required for decolorization, and several hours' treatment affected the organisms only by tingeing them slightly violet on intensive methylene blue staining.

Rapid method. Stain for 5 to 6 minutes cold with carbol-fuchsin. Wash and decolorize in 10 per cent sodium sulphite. Counterstain in 1 per cent malachite green, or very quickly in diluted methylene blue.—L. A. K.

425. *A Method for Labeling Slides Used in Routine Stool Examinations.* FRANK G. HAUGHWOUT. Philippine J. Sc., Manila, 1919, **15**, 535–537.

The slide is labelled by attaching to one end, by means of an ordinary paper clip a paper label, upon which is written the number of the slide.—M. W. C.

CANCER RESEARCH

426. *Skin Involvement in Breast Cancer with Reference to its Bearing on the Interpretation of Appearance of Transition between Normal Epithelium and Cancer.* ALSON R. KILGORE. J. Cancer Research, 1920, **5**, 291–300.

Among 475 mammary carcinomata, the epidermis has been more or less closely in contact with the tumor in 50. Yet in not one of these was there any evidence of malignant change in the epidermal epithelium.—W. H. W.

427. *On the Kinetic and Invasive Power of Regenerating Tissue and on Similarities in the Behavior of Thyroid Transplants and Carcinomas.* LEO LOEB. J. Cancer Research, 1920, **5**, 261–277.

Regenerating thyroid may possess an invasive power not unlike that of cancerous tissue, entering the blood vessels and invading fat and muscle, though the invasive power is less intense than that exhibited by very active carcinomata. In contradistinction to carcinoma, regenerating growth of the thyroid finally comes to a standstill, although the typical structures of the thyroid may not yet have been established.—W. H. W.

428. *Malignancy of the Crown-gall and its Analogy to Human Cancer.* ISAAC LEVIN AND MICHAEL LEVINE. J. Cancer Research, 1920, **5**, 243–260.

Crown-gall is a neoplastic disease which offers an ideal material for the cytologic study of cancer. It occurs both as a benign and as a malignant condition. The benign crown-gall, analogous to granuloma or cheloid in man, is caused by *Bacterium tumefaciens.* The malignant crown-gall is analogous to true cancer, but *Bacterium tumefaciens* is not the direct cause of the malignant transformation.—W. H. W.

429. *Rhabdomyoma of the Ovary.* H. E. HIMWICH. J. Cancer Research, 1920, **5**, 227–241.

This occurred in an infant one and a half years of age, and represented a rhabdomyoma of the heart in a twin inclusion.—W. H. W.

430. *The Glycemic Reaction in its Relation to Transplantable Malignant Tumors.* G. L. ROHDENBURG. J. Cancer Research, 1920, **5**, 279–289.

A transient hyperglycemia occurs in rats after injection of adrenalin. The type of this hyperglycemia is not distinctive nor characteristic after inoculation with transplantable tumor, irrespective of whether or not the tumor graft grows.

Heterologous protein extracts induce hyperglycemia in normal animals and in those bearing transplantable tumors, as well as in spontaneous tumor-bearing animals.

Autologous protein extracts do not cause a hyperglycemia in normal or spontaneous tumor-bearing animals; they occasionally cause a hyperglycemia in animals bearing transplantable tumors, if the autologous tissue be the tumor itself.

Homologous protein extracts cause a hyperglycemia in normal animals and in animals bearing transplantable malignant tumors; they do not cause a hyperglycemia in animals in which spontaneous malignant tumors are growing.

Homologous protein, which is able to induce immunity against subsequent inoculation of a tumor, gives rise to a hyperglycemia, while autologous protein extract, which has not the power of conferring immunity, does not give rise to a hyperglycemia when injected into normal animals. A negative glycemic reaction, therefore, might be interpreted as an inability of the organism to produce antibodies against the substance injected. That such an interpretation is probably correct is shown by the fact that of animals bearing transplanted tumors, 75 per cent of those in which the tumor grows fail to give a glycemic reaction when injected with extracts of protein of the tumor, while those animals in which the tumor recedes give a glycemic reaction in 69 per cent of the cases. Animals in which the tumor recedes probably produce antibodies against the tumor, even though these cannot be demonstrated by any method at present known.—W. H. W.

431. *A Study of the Oxidase Reaction with A-naphthol and Paraphenylendiamine in Tumors.* MAUD L. MENTEN. J. Cancer Research, 1920, **5**, 321–344.

Development of color in the reagent is due to oxidation. Therefore, when the adsorption of the reagent by a tissue is followed by an increase in the intensity of the color, increased oxidative capacity has been developed in the reagent. This involves a corresponding tissue change in the nature of a reduction.

The more marked the oxidase reaction the greater the reduction occurring in the reacting tissue, and *vice versa*.

Cell constituents of certain tissues, in which a slight oxidase reaction normally develops, may through degenerative processes be converted into new colloidal complexes in which a a maximum reaction obtains. Examples of such alterations in intensity of reaction are found in connective tissue (spindle-cell sarcoma) and in stratified squamous epithelium (epithelial pearls of epithelioma). These variations are associated with a transformation of potential into kinetic energy and indicate a considerable degree of lability of granules.

It is a noteworthy coincidence that this lability of cell granules as measured by variations, in the oxidase reaction, occurs in tissue with a high regenerative capacity.

In the nuclei, intensity of color reaction may be increased or diminished. The first occurs in degenerative processes, the latter is observed in cells which are rapidly proliferating.—W. H. W.

432. The Response of the Animal Organism to Repeated Injections of an Active Deposit of Radium Emanation. Intravenous Injections in Dogs. HALSEY J. BAGG. J. Cancer Research, 1920, **5**, 301–319.

These experiments on dogs parallel a similar set previously carried out by the same author on white rats.

Large intravenous doses of an active deposit of radium emanation produced a considerable reduction (80 per cent) in the number of white blood cells, and a smaller reduction (25 per cent) in the erythrocytes.

Digestive disturbances, such as severe vomiting and diarrhea, followed large doses. In several cases a rise of temperature followed the treatment. Large doses caused a decided increase in the total nitrogen content of the urine, the urea, creatinine, uric acid, and the total phosphates.

Histological study of the organs demonstrated considerable congestion in the principal viscera. The liver showed a general fatty and granular degeneration, the kidneys a granular degeneration of the tubule cells, and the spleen an extensive congestion. The bone marrow was devoid of lymph tissue, which was largely replaced by fat, and there was extreme congestion of the pulp of the lymph-nodes in one animal, associated with a reduction in size of the lymph-follicles.—W. H. W.

433. The Peroxidase Reaction in three Cases of Multiple Myeloma of the Bones with Remarks concerning the Nosological Position of these Tumors. PLINN F. MORSE. J. Cancer Research, 1920, **5**, 345–371.

Three cases of non-oxidase reacting myelomata are reported, and data are presented which the author interprets to support the theory that the so-called "plasma-cell" type of myeloma is not of myeloblastic origin and has no relation to the leucemic group.

It is suggested that the "plasma-cell" myelomata spring from a series of cells whose specific function is bone absorption, and that the myeloma cell may be a heteroplastic "osteoblast."—W. H. W.

434. Ueber Röntgenbehandlung des Hautkrebses. (*X-ray Treatment of Skin Carcinoma.*) THEDERING. München. med. Wchnschr., 1920, **67**, 1119–1120.

Carcinomatous tissue and the adjoining glands are a single pathologic unit and ought not to be handled in separate X-ray treatments. The glands are always to be irridated first. The aim must be to treat with a single maximal dose.—B. C.

435. Experimentelle onkologische Studien. (*Experimental Oncologic Studies.*) R. SOMOGYI. Ztschr. f. Krebsforsch., Jena, 1919, **17**, 100. (Abstr. in Bull. de l'Inst. Pasteur, Par., 1920, **18**, 732.)

A repetition of Kiralyfi's experiments with benzol. In one case, benzol prevented the growth of a spindle-cell rat sarcoma, while in 4 animals growth was retarded. No toxic effects were noted from the amounts employed—0.2 to 1.0 cc. by mouth or given subcutaneously mixed with an equal volume of oil, every day for from 4 to 35 days.—W. H. W.

436. Further Observations of the Effects of X-ray upon Lymphocytes. RUSS, CHAMBERS AND SCOTT. J. Path. & Bacteriol., 1920, **23**, 477.

A normal rat exposed for 12 seconds to x-rays and examined an hour later, shows a reduction of some 50 per cent in the circulating lymphocytes. The time may be considerably increased or decreased (2 seconds to 30 minutes) without any appreciable change in this percentage. Counts made at short intervals show that the fall is gradual. Rats immune from spontaneous regression of a Jensen sarcoma, however, show an average fall of only 30 per cent; their lymphocytes are less susceptible than those of a normal animal.

To determine the effect of repeated raying, a normal rat was exposed for 12 seconds. The typical 50 per cent drop occurred an hour afterward. During the succeeding hours, when the count would normally show a tendency to return to normal (which it attains in 24 hours) the animal was given repeated 12-second exposures, but the rays had no effect on the number of lymphocytes. The proportion continued to rise and reached normal in 24 hours, as it does after a single raying. But after the lapse of 24 hours, a typical 50 per cent drop could be again elicited. This result the authors are unable to explain.—W. H. W.

437. Autoplasty after Exposure to Hot Air. J. A. Murray. Lancet, Lond., 1920, **2**, 1096.
In 9 mice with spontaneous growths, autoplastic transplantation was performed after 10 minutes' exposure to dry heat. In these, retardation or failure of the graft was observed—a proportion of negative results only slightly higher than in untreated mice. Homoplastic grafting of a transplantable tumor after the same exposure did not show any effect.—W. H. W.

438. Zur Kollargolbehandlung der Blasenpapillome. (*Collargol Treatment of Cystic Papilloma.*) G. Praetorius. München. med. Wchnschr., 1920, **67**, 1096–1097.
Collargol seems to have a decided selective affinity for the tumor and leaves the normal cystic mucosa intact. It is intimated, however, that the action is not complete or constant. If necrosis is not complete in a week, carcinoma is to be suspected.—B. C.

439. Tests for Physiological Differences in Transplantable Tumors. L. C. Strong and C. C. Little. Proc. Soc. Exper. Biol. & Med., N. Y., 1920, **18**, 45.
Two neoplasms, histologically identical, were shown to give different percentages of takes in a uniform race of mice, one of the growths always producing a larger number of daughter tumors than the other. Hence physiological differences among tumors of the same general type are independent of histological differences. The difference lies, not in fluctuations in the tumor cell, and not in cytological differences, but in genetic variations in the host.—W. H. W.

440. Sarcome à cysticerque et carcinome spiroptérien chez un meme rat. (*Sarcoma Due to a Cysticercus and Carcinoma Due to a Spiropteron in the Same Rat.*) T. Eiken. Compt. rend. Soc. de biol., Par., 1920, **83**, 695.
Report of the observation.—W. H. W.

441. The Influence of Certain Diets upon Tumor Susceptibility and Growth in Albino Rats. Kanematsu Sugiura and Stanley R. Benedict. J. Cancer Research, 1920, **5**, 373–401.
The authors review extensively the previous work of others on the relation between diet and tumor growth, and describe experiments with the Flexner-Jobling rat carcinoma. A normal diet consisted of wheat bread soaked in whole milk, and fresh carrots or cabbage. Their experimental diets were: banana-casein-yeast-protein-free-milk; banana-casein-yeast; banana-casein; and banana alone.
None of these experimental diets altered the malignant character of the tumor, though in many instances the rate of growth was distinctly diminished.—W. H. W.

442. Primary Spontaneous Tumors of the Ovary in Mice. Studies on the Incidence and Inheritability of Spontaneous Tumors in Mice. Fourteenth Communication. Maud Slye, Harriet F. Holmes and H. Gideon Wells. J. Cancer Research, 1920, **5**, 205–226.
Among 22,000 mice of the Slye stock dying natural deaths at all ages, were 44 mice with spontaneous primary ovarian tumors not including simple ovarian cysts. Of these, 38 had simple benign solid papillary adenomas, only occasionally with slight cyst formation. One showed a typical papillary cystoma. One had a typical solid teratoma containing a great diversity of tissue elements. (A second case of teratoma was observed after this analysis was made.) Of the 38 cases of solid papillary adenomas, 19, or 50 per cent, were bilateral, so that there were 57 tumors of this class. There were 4 unquestionably primary malignant tumors of the ovary, all showing the "mesothelioma" type of growth characteristic of malignant tumors derived from the sex glands; one of these produced perirenal metastases. There was one other tumor of the same type primary in either the ovary or the adrenal. Two round-cell sarcomas were found that arose either from the ovary or some other organ, while two other sarcomas had produced secondary growths in the ovary. Of the 44 mice with primary ovarian tumors, 26 had tumors in other parts of the body,
In the literature were found reports of 8 other cases of tumors arising in the ovaries of mice, which exhibited quite the same characteristics as the tumors described in this paper.—W. H. W.

443. Cancer primitif der pancréas et cellules géantes chez la souris. (*Primary Cancer of the Pancreas and Giant Cells in the Mouse.*) L. Mercier and C. Lebailly. Bull. de l'Inst. Pasteur, Par., 1920, **18**, 642.
Round-cell sarcoma with giant cells containing one or more nuclei.—W. H. W.

444. A Preliminary Report on the Experimental Production of Sarcoma of the Liver of Rats. F. Bullock, M. Curtis and G. L. Rohdenburg. Proc. Soc. Exper. & Biol. Med., N. Y., 1920, **18**, 29.
In a group of 500 rats infected with *Cysticercus fasciolaris* by feeding eggs of *Tenia crassicolis* obtained from cat feces, there have so far occurred (up to 357 days after infection) 5 sarcomata of the liver. These sarcomata, which were of the spindle-cell or the polymorphous-cell variety, arose in the walls of cysts containing living (in one case) or dead worms. Four of the tumors metastasized freely in the peritoneum. The two which were transplanted gave 92 per cent and 46 per cent of successful inoculations.—W. H. W.

445. The Action of X-rays upon the Transplantation of a Spontaneous Carcinoma of the Rat. CHAMBERS, SCOTT AND RUSS. J. Path. & Bacteriol., 1920, **23**, 384.

Small doses of x-ray make rats more susceptible to inoculation, and the authors suggest that the method may be of use in cultivating difficult tumors.—W. H. W.

446. Ueber bösartige Blasengeschwulste bei Arbeitern der organish-chemischen Grossindustrie. (Malignant Tumors of the Bladder of Workers in the Organic Chemical Industries.) Frankfurt. Ztschr. f. Path., Wiesb., 1920, **22**, 64. (Abstr. in Centralbl. f. Path., 1920, **31**, 64.)

Critical review. The length of time intervening between the first exposure to anilin fumes, and the first symptom, depends upon individual susceptibility and upon the presence or absence of impurities in the vapor. The purer the anilin fumes, the longer the latent period. It seems odd that workers who breathe diluted anilin fumes in adjoining buildings should succumb sooner than those exposed to stronger concentrations. On the whole, the latent period is 20 or more years.—W. H. W.

447. Experimentelle Untersuchungen über die Wirkung langdauernder Anilin-Inhalationen. (Experimental Research Concerning the Effect of Long Continued Inhalation of Anilins.) R. JAFFÉ. Centralbl. f . allg. Path. u. Path. Anat., Jena, 1920, **31**, 57.

Of 23 animals (mice, rats, rabbits) exposed to vaporized anilin, toluidin, or naphthylamin, the majority lived some 6 months, though a few survived 1½ years. None developed a tumor in the bladder.—W. H. W.

448. Tumors of the Bladder among Workers in Anilin Factories. W. G. SPENCER. Med. Sci.: Abstrs. & Reviews, 1921, **3**, 316.

A review of the recent literature.—W. H. W.

449. Surgery vs. Cancer. S. W. LITTLE. Boston M. & S. J., 1920, **183**, 745.

The cancer death-rate (62.9 per 100,000 in 1900, 80.5 per 100,000 in 1919) is gradually rising, and has been uninfluenced by surgical intervention.

(But the reviewer does not believe it justifiable to conclude that surgery is useless. For the number of patients who are so fortunate as to secure competent surgical treatment at the earliest possible moment, is still pitifully small; so small as to make practically no impression on the total figure. The answer is obviously not to abandon surgery, but to have earlier surgery and better surgery available for every cancer patient. One of these desiderata can be obtained by educating the public, the other by raising the general standard or surgery to a point approximating as nearly as may be the skill of the masters.)—W. H. W.

DISEASES OF THE BLOOD, LYMPHATICS AND DUCTLESS GLANDS

450. Streptococcus hemolyticus: A Case Study. HARRY G. JOHNSON. Philippine J. Sc., Manila, 1920, **17**, 91–96.

A generalized infection with *Streptococcus hemolyticus* is reported.—M. W. C.

451. Weilsche Krankheit und Spirochetosis icterohaemorrhagica. (Weil's Disease and Spirochetosis Icterohemorrhagica.) G. SOBERNHEIM. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1160–1161.

Immunological experiments indicate that Inada's *Spirocheta icterohemorrhagiae* isolated in Japan is identical with the spirochete causing Weil's disease in Europe.—B. C.

DISEASES OF THE CIRCULATORY SYSTEM

(*See also Number 553*)

452. Herzmuskeltonus und postdiphtheritische Herzlähmung. (Cardiac Muscle Tonus and Post-diphtheritic Cardiac Damage.) U. FRIEDEMANN. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1134–1136.

In post-diphtheritic heart failure the usual symptom is cardiac dilatation while in most other infectious diseases there is no dilatation, though the contractility of the cardiac muscle has suffered. This heart failure is always accompanied by vascular damage.—B. C.

453. Der gegenwärtige klinische Stand der Herz- und Gefässlues. (The Present Clinical Status of Heart and Vascular Syphilis.) HEINRICH ROSIN. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1114–1117.

A discussion of the clinical features in the differentiation of arteriosclerosis of syphilitic and other origin.—B. C.

DISEASES OF THE DIGESTIVE SYSTEM

(See also Number 411)

454. *De la pathogénie du choléra. Quatrième mémoire. Le gastroentérotropism des vibrions. (The Pathogenesis of Cholera. IV. The Gastroenterotropism of the Vibrios.)* G. SANARELLI. Ann. de l'Inst. Pasteur, Par., 1920, **34**, 871–887.

In previous papers, Sanarelli has demonstrated that the cholera vibrios injected into the peritoneal cavity of a guinea pig pass by way of the omental lymphatics into the thoracic duct and thence into the blood. The question investigated in this work is that of the fate of the cholera vibrios which escape from the peritoneal cavity. He shows that the serum of a normal guinea pig, when tested *in vitro*, has no bactericidal action upon the vibrios. By cultures of the blood and from the organs of guinea pigs at different intervals of time after the intraperitoneal injection of a non-fatal dose of cholera vibrios, he finds that the vibrios soon pass out of the blood stream and localize only in the wall of the intestine. The walls of the intestine are both the most favorable place for the proliferation of the vibrios and also the organ through which they are excreted. In coming, to this conclusion, however, it was impossible to exclude the passage of vibrios from the peritoneal surface of the intestine directly through its wall into the submucosa by way of the lymphatics situated there.—S. B-J.

455. *De la pathogénie du cholera. Quatrième memoire, suite. Le gastroentérotropism des vibrions. (The Pathogenesis of Cholera. IV, continued. The Gastroenterotropism of the Vibrios.)* G. SANARELLI. Ann. de l'Inst. Pasteur, Par., 1920, **34**, 973–1029.

The author shows first that the blood of guinea pigs is not bactericidal for cholera Vibrios. The animals do not die from the liberation of endotoxins from the vibrios through their destruction in the peritoneum or blood stream. After intraperitoneal injection of cholera vibrios, the bacteria pass into the walls of the intestines through the lymphatics and lodge there also from the blood which contains them during a stage of transitory vibrionemia. The vibrios were found in the stomach and buccal and pharyngeal mucous membranes after intraperitoneal injections. The vibrios, therefore, possess an extraordinary gastroenterotropism, causing them to localize in the walls and lumen of the gastrointestinal tract. Here they multiply and cause the death of the animal.

It has not been possible to reproduce in guinea pigs the algid stage of cholera in man.—S. B-J.

456. *Contribution a l'étude des infections intestinales. Le Bacillus bookeri. (Contribution to the Study of Intestinal Infections. Bacillus bookeri.)* H. TISSIER. Ann. de l'Inst. Pasteur, Par., 1920, **34**, 684–689.

Among the proteolytic bacteria which apparently are responsible for digestive disturbances, the author places *B. bookeri*. In this paper, he amplifies the original description of this micro-organism given by Ford in 1903. *B. bookeri* is morphologically very similar to *B. coli*, and is non-motile. It is a facultative anaerobe, growing best at 22°C to 37°C. On agar it has a slight brown color. It liquefies gelatin. *B. bookeri* does not attack starch and only slightly affects the sugars. Its action is chiefly proteolytic, but is not so destructive of protein as *Proteus vulgaris*. It does not form indol or phenol. It is pathogenic for the usual laboratory animals, and causes a slight diarrhea when fed to monkeys.—S. B-J.

457. *Beobachtungen bei Dysenterie. (Observations on Dysentery.)* RUDOLF STREMPEL. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **85**, 68–80.

One cause of the small percentage of recognitions of the dysentery bacillus in dysentery stools is to be found in the bactericidal action of the bloody stools and in their acid reaction. The author emphasizes that in addition to the dysentery bacilli known, other microörganisms can evoke a dysentery-like picture. The utilization of the agglutination test is also discussed. Flies are important agents in the distribution of the disease.—R. E. B.

458. *Bakteriologische Untersuchungsergebnisse der Mannheimer Ruhrepidemie Juli bis November 1917. (The Results of Bacteriological Studies of Mannheim Dysentery Epidemic of July to November, 1917.)* ILSE LAUBER. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **84**, 201–214.

Studies were made of 864 stools in which 42 per cent gave positive results for the dysentery bacilli. Of these, 37 per cent proved to be Shiga-Kruse bacilli and 5 per cent Flexner bacilli. The importance of flies in the distribution of the disease is emphasized. Methods of transporting stool samples containing dysentery bacilli are discussed in detail. A study was also made of the agglutinins present in the blood serum of the patients.—R. E. B.

459. *Clinical Analysis of One Hundred Cases of Enterocolitis with Especial Reference to Edema, Dehydration, and Putrid Odor of Stools.* JOSÉ ALBERT AND FÉ HORILLENO. Philippine J. Sc., Manila, 1920, **17**, 27–30.

The content of the article is indicated by the title.—M. W. C.

DISEASES OF THE GENITO-URINARY SYSTEM

(*See also Numbers 333, 348, 395, 571, 572*)

460. *The Value of the Cultural Method in the Diagnosis of Chancroid.* O. TEAGUE AND O. DEIBERT. J. Urol., Balt., 1920, **4**, 543–550.

The growth of the Ducrey bacillus has been regularly obtained on clotted rabbit or human blood in treated as well as untreated cases.

The organisms on this medium occur in characteristic long chains which are not usually found in smears of pus from the ulcers.—R. D. H.

461. *The Action on the Gonococcus of Sodium Oleate, Alone and in Combination with Other Drugs.* D. M. DAVIS AND E. O. SWARTZ. J. Urol., Balt., 1920, **4**, 409–418.

Sodium oleate has a definite germicidal value for the gonococcus which is increased in the presence of uncoagulated protein by the addition of boric acid.—R. D. H.

462. *Beiträge zur pathologischen Histologie der gonorrhoischen Epididymitis.* (*A Contribution to the Pathological Histology of Gonorrheal Epididymitis.*) J. WOLF. Virchow's Arch. f. Path. Anat. (etc.), Balt., 1920, **228**, 227–246.

The author describes a metaplasia of cylindrical to flattened epithelium.—S. A. G.

463. *Beziehungen verschiedener Gonokokkenarten zur Schwere der Infektion.* (*Relations of Different Gonococcus Strains to Severity of Infection.*) K. W. JÖTTEN. München. med. Wchnschr., 1920, **67**, 1067–1069.

By means of agglutination and complement fixation, 20 strains of gonococcus out of 27 could be classified into 4 different groups. Members of Groups A and B showed in addition to higher resistance to the opsonic, bacteriotropic and bactericidal power of normal serum, a greater toxicity toward mice than the others. Infections by members of Groups A and B were also usually more serious. For the treatment of gonococcus infections, it would appear that autogenous vaccines promise greatest success.—B. C.

464. *Experimental Production of Clinical Types of Syphilis in the Rabbit.* W. H. BROWN AND L. PEARCE. Arch. Dermat. & Syph., Chicago, 1921, **3**, 254–262.

A comparison was made on the course of infection in two series of rabbits with unilateral and bilateral testicular inoculations according to groups treated by early castration, late castration and therapeutic suppression of testicular reaction. In the fourth or control group the infection was permitted to take its natural course.

The results indicate that the variability of clinical types may be produced by modification of the defensive reaction.—R. D. H.

465. *Dissemination of Spirochaeta pallida in Experimental Syphilis.* F. EBERSON. Arch. Dermat. & Syph., Chicago, 1921, **3**, 111–116.

Spirochaeta pallida have been isolated from the blood stream and from the regional lymph glands 7 days after intratesticular inoculation and 26 days prior to the initial lesion.

The spleen contained *Spirochaeta pallida* 2 months after healing of the inoculated testicle as determined by repeated examinations and inoculations into other rabbits.—R. D. H.

466. *Spirocheta pallida Befund in der Zervix bei primären Lues.* (*Finding of Spirocheta pallida in the Cervix in Primary Syphilis.*) DORA FUCHS. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1165–1167.

The cervical secretion and mucosa should be carefully examined whenever infection is suspected, even though the clinical symptoms of syphilis are absent. Cases are cited showing the value of this procedure.—B. C.

467. *Mislungene Abortivbehandlung der sogenannten primären seronegativen Lues.* (*Unsuccessful Abortive Treatment of so-called Primary Seronegative Syphilis.*) MEIROWSKY AND LEVEN. München. med. Wchnschr., 1920, **67**, 1040–1041.

In the majority of cases, abortive salvarsan treatment of early primary syphilis results in the continued absence of the positive Wassermann reaction and of external symptoms. There are a number of cases, however, in which such a result is not attained. Seven such cases are cited. Warning is uttered against assuming that early abortive treatment with salvarsan in all such conditions will result in prompt cure.—B. C.

468. *Latente Halslues-Familieninfektionen.* (*Familial Infections due to Latent Syphilis of the Throat.*) GERBER. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1110–1112.

Syphilis of the upper respiratory tract is highly infectious. Ignorance is wisespread regarding the fact that the disease may be localized in the mouth and throat and for a long time go unrecognized. Medical diagnosis of syphilis in the throat is often not easy and requires experience and special practice.—B. C.

469. *Weitere Erfahrungen bei Rekurrensinfektionen.* (*Further Results with Recurrent Infections.*) F. Plaut and G. Steiner. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1101–1102.

Spirosoma duttoni was used in the recurrent fever therapy of general paralysis. This organism in the human host is resistant to salvarsan treatment and may remain viable and virulent after at least 8 weeks. Curiously enough, it is not salvarsan-fast when the white mouse is the host. Passage of the organism through the mosquito does not alter this property. The observation that paralytics after a recurrent fever infection may lose their positive Wassermann reaction would indicate that the activity of *Treponema pallida* may be actually reduced in this way.—B. C.

DISEASES OF THE LOCOMOTOR SYSTEM

470. *Ueber rheumatische Lumbago.* (*Rheumatic Lumbago.*) Friedr. Schultze. München. med. Wchnschr., 1920, **67**, 1109–1111.

The author describes his own symptoms in detail, and discusses the possible etiology of the malady.—B. C.

DISEASES OF THE NERVOUS SYSTEM

471. *Étude expérimentale de l'éncéphalite dite léthargique.* (*Experimental Study of Lethargic Encephalitis.*) C. Levaditi and P. Harvier. Ann. de l'Inst. Pasteur, Par., 1920, **34**, 911–972.

Levaditi and his associates were unable to cultivate any microorganism from nervous tissue of cases of encephalitis lethargica. They found, however, that in the fluid of attempted cultures the virus remained active, in symbiosis with animal cells for 15 days at 37°C. The virus used by them in this study was obtained from the cerebral cortex, central nuclei and medulla of cases of encephalitis lethargica in man. The virus was not at first pathogenic for monkeys, but after passage through rabbits it assumed fixed virulence both for rabbits and monkeys. The virus is filterable, can be preserved in glycerin, resists heat at 56°C., and is still infective 48 hours after the death of the animal.

The lesions produced, illustrated by colored plates in this paper, and the symptoms in the experimental animals were very similar to those in man. The disease was transmissible by intracranial, intraocular or intraneural inoculations. Intravenous and other routes of inoculation of the virus were ineffectual. The infected animals harbored the virus in the nervous system, and probably excreted it through the nasopharyngeal mucous membrane. The blood was never infectious.

None of the infected animals recovered. Slight immunity was produced by vaccination with the virus. The serum of vaccinated animals and convalescent human cases did not possess any protective power. The usual sera effective against poliomyelitis had no protective action against the virus of encephalitis. The authors think that the two diseases are distinct on symptomatological, pathological and immunological grounds.—S. B-J.

472. *Beiträge zur Kenntnis der Lyssa.* (*Contribution to Our Knowledge of Rabies.*) Toshinobu Ohira. Centralbl. f. Bakteriol. (etc., Jena, I. Abt. Orig., 1920, **84**, 528–535.

A case of recurrent rabies was reported from Japan. The patient was taken in July, 1911, and had a mild attack of rabies in August, 1912. From this he recovered. The disease recurred in January, 1913, developed into typical rabies, and led to the death of the patient. Negri bodies were demonstrated and typical rabies was produced in rabbits by injection both corneal and subdural into rabbits.

The author also discusses the presence of the rabies virus in the blood. Only once was it possible to demonstrate this in the blood of a rabbit. Guinea pigs and mice proved uniformly negative. Both street and fixed viruses were studied.—R. E. B.

473. *Über den Charakter der Entzündung bei der Meiningokokkenmeningitis.* (*The Nature of the Inflammation in Meningococcic Meningitis.*) G. B. Gruber. Virchow's Arch. f. Path. Anat. (etc.), Berl., 1920, **228**, 216–226.

In the very acute cases there is a fibrino-purulent inflammation. In those of longer standing, 1–8 weeks, there is an accumulation of lymphocytic elements. There is an inflammation of the venous walls of the pia as well as of the subventricular tissue. The latter is observed in pneumococcia and to a lesser degree in tuberculous and chronic mixed forms of meningitis. It is a perivascular inflammation brought about by toxins and split protein products carried away by the veins from the larger inflammatory area. Perhaps such material may also diffuse from the ventricle into the lymph channels that follow the walls of such veins. This may explain the excentric infiltration of the subependymal veins.—S. A. G.

474. *Hemorrhagic Meningoencephalitis in Anthrax. A Report of Three Cases.* S. John House. J. Infect. Dis., Chicago, 1920, **27**, 513–526.

Among cases of anthrax occurring in workers in the "curled hair" industry in Chicago, there were examples of anthrax infection of the meninges and brain. Two of these were diagnosed only at autopsy.

The brain of anthrax meningoencephalitis is covered with a bloody exudate, and is characterized as a "soft red viscid brain." On account of the large amount of blood on the surfaces and numerous hemorrhages in the brain substance, the lesions might be mistaken for trauma. Stains of the exudate, however, readily reveal anthrax bacilli in large numbers, and this opinion can be readily confirmed by bacteriologic studies.

The lesions in the brain in anthrax are essentially perivascular, with inflammation of the meninges. The chief accumulations of the microorganisms are found in the adventitia of the arterioles, where they have apparently been deposited in the capillaries of the vasa-vasorum. A number of interesting vascular lesions, affecting the various coats of the blood vessels were observed in the sections from these cases. The acute hemorrhagic, non-purulent nature of the inflammation of the meninges and brain, with edema and destruction of tissue is similar to foci of acute anthrax infection in other parts of the body.—S. B-J.

DISEASES OF THE RESPIRATORY SYSTEM (EXCEPT INFLUENZA AND TUBERCULOSIS)

(*See also Numbers 345, 477, 528, 567*)

475. Mechanism of the Carrier State with Special Reference to Carriers of Friedlaender's Bacillus. ARTHUR L. BLOOMFIELD. Johns Hopkins Hosp. Bull., Balt., 1921, **32**, 10–13.

In a study of 85 unselected individuals Bloomfield found 5.8 per cent to be carriers of Friedländer's bacillus and these remained such during the period of observation. The breeding place of the organism was in the tonsils. He also found contacts did not become carriers and that the implantation of the carrier's own strain or of a foreign strain of Friedländer's bacillus upon the surface of the carrier's mucous membrane did not result in the permanent colonization of the organism on the surface of the mucous membrane, nor could he produce the carrier state in normal individuals artificially by repeated surface inoculation of the mucous membrane with Friedländer's bacillus.

Bloomfield concludes from such observations that the carrier state is contingent upon a focus of diseased tissue which serves as a breeding place for bacteria and that these organisms do not become adapted to growth on the surface of the mucous membrane.—F. W. H.

476. Pulmonary Findings due to Circulatory Changes. J. S. PRITCHARD AND M. A. MORTENSEN. Am. Rev. Tuberc., Balt., 1920, **4**, 620–625.

"1. All pulmonary signs and symptoms call for a careful study of the possible etiological factors.

"2. Physical signs in the lung should not be the only basis in making the diagnosis.

"3. Myocardial embarrassments of different types produce pulmonary signs and symptoms which are often misinterpreted.

"4. In many cases of bronchitis, where doubt of the cause exists, the use of digitalis results in the diminution of symptoms and physical signs, thereby making this drug of value in diagnosis as well as a therapeutic agent.

"5. In many cases with bronchial symptoms, such as are present in protracted colds, circulatory degeneration should be considered as a possible causative factor as well as upper respiratory affections and pulmonary tuberculosis.

"6. Rales due to circulatory causes are not always basal and may be found over other parts, even one or both apices."—T. G. H.

INFLUENZA

(*See also Numbers 338, 341, 515, 560, 567*)

477. Zur Aetiologie von Schnupfen und Grippe. (*The Etiology of Colds and Influenza.*) P. SCHMIDT. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1181–1182.

Injection of 196 persons with Berkefeld filtrates of secretions from bronchial catarrhs (colds) resulted in 3 cases of influenza and 22 cases of colds; 84 injections with filtrates from influenzal secretions resulted in 5 cases of influenza and 4 colds. Forty-three simultaneous control injections of saline resulted in 8 colds but not a single case of influenza. Cultivation of 4 filtrates from influenza yielded pure cultures of streptococci of the viridans type. These results are confusing and show that further investigation is needed.—B. C.

478. Agglutination in Inflyenza. K. UTHEIM. J. Infect. Dis., Chicago, 1920, **27**, 460–463.

The strains of *B. influenzae* were obtained from nose and throat cultures. The antigen for the agglutination tests was prepared as follows: 48-hour cultures grown on blood agar were suspended in 0.8 per cent salt solution and shaken thoroughly until a homogeneous emulsion was obtained. The "anti-sera" used were obtained from patients ill with or convalescent from "influenza."

Of 30 strains isolated from patients with influenza, 11, or 36 per cent, were agglutinated by the patient's serum (titers 1:20 or 1:160). Only one of the 30 strains was agglutinated by a "heterologous" serum, e.g., serum from another patient.—S. B-J.

479. *Serologische Untersuchungen bei Grippe und Encephalitis epidemica.* (*Serological Studies in Influenza and Epidemic Encephalitis.*) R. Bieling and R. Weichbrodt. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1183-1184.

A suitable antigen is necessary when examining serums of influenza patients for agglutinins. During the course of influenza, almost all patients show increasing amounts of influenza agglutinins in their sera. This fact gives no conclusive evidence as to the etiology of the disease, but indicates at least that influenza bacilli have a special significance in the origin and course of the disease.

In the majority of cases of epidemic encephalitis, agglutinins for the influenza bacillus were demonstrated in the blood serum during the disease. It appears, therefore, that the influenza bacillus plays a significant rôle in this disease and that encephalitis and influenza are correlated serologically.—B. C.

480. *Complement Fixation in Influenza with B. influenzae Antigens.* J. V. Cooke. J. Infect. Dis., Chicago, 1920, **27**, 476–481.

Complement fixing antibodies were demonstrated in the serum of children and adults convalescent from influenza by the use of antigens prepared from *B. influenzae*. The antigens used were suspensions of blood agar cultures of *B. influenzae* (isolated from nasopharynx). The emulsions, of "moderate opacity," were heated to 65°C. for 1 hour. The antigens were somewhat anti-complementary. Usually a 1:4 to 1:5 dilution was used. One-tenth cubic centimeter of the antigen was the amount used in each test. The usual antisheep—guinea pig—hemolytic system was employed throughout. The sera were obtained from individuals suffering with or convalescent from influenza. Sixteen strains of *B. influenzae* were tested against 48 serums. Cross fixations sometimes occurred, but definite antigenic relationship between the various strains of *B. influenzae* was not established.—S. B-J.

481. *Relation of Different Strains of Influenza Bacilli as shown by Cross Agglutination and Absorption Tests.* H. H. Bell. J. Infect. Dis., Chicago, 1920, **27**, 464–475.

The results of agglutination and absorption reactions with 36 strains of Pfeiffer's bacillus isolated from throat cultures in St. Louis are reported in this paper. The organisms satisfied the usual definition of *B. influenzae*. Twenty-seven rabbits were immunized to different strains and bled when the titer of the serum was above 1:1600. For the agglutination tests, emulsions of the bacteria were made by washing a 24-hour growth from the surface of a brown blood agar slant with salt solution. The emulsions of 4 organisms were not homogeneous, except under certain conditions.

Cross agglutination occurred frequently in low dilutions and sometimes in high dilutions. Absorption tests were employed in those instances which showed cross agglutination in dilution 1:800 or above. The results with the various strains are tabulated in detail. They show that while the group of influenza bacilli is extremely heterogeneous, *identical strains are found in different persons.*

By agglutination and morphological studies it was found that a person may carry in the throat 3 different strains of this organism at the same time.—S. B-J.

482. *Untersuchungen über den Pfeifferschen Influenzabazillus während der Grippepandemie 1918–1920. I.* (*Studies on the Pfeiffer Influenza Bacillus during the Grip Pandemic of 1918–1920. I.*) Otto Olsen. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **84**, 497–513.

The writer reports the result of the bacteriological study of influenza cases in the St. George Hospital in Hamburg. The influenza bacillus was isolated in 75 per cent of the cases coming to autopsy, in the smaller percentage of cases streptococci, staphylococci and pneumococci were found. The organisms were isolated directly from lung tissue under blood agar. The relationship between composition of medium and growth of the organism is discussed. Careful description is also given of the morphology and cultural characteristics of the organism. The remainder of the article is given over to an argument for the causal relationship of the Pfeiffer bacillus to the disease. It cannot be regarded as a secondary invader. Lastly, the author reviews the literature on filterable virus as a cause of influenza. He concludes that no such causal relationship has been demonstrated.—R. E. B.

483. *Ueber chronische Grippe.* (*Chronic Influenza.*) G. Treupel. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1159–1160.

There is a chronic form of influenza which is similar to tuberculosis in its general symptoms (increased temperature, night sweats and elastic fibers in the sputum).—B. C.

484. *Ueber eine Beobachtung von Lungenverschimmelung bei Grippe.* (*Pneumonomycosis in Influenza.*) Ernst Friedrich Müller. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1169–1170.

Aspergillus fumigatus was found in the case described.—B. C.

485. *Pneumonomykosis aspergillina bei Grippe.* (*Aspergillus Pneumonomycosis in Influenza.*) Kurt Kleberger. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1170–1171.

A reduced resistance following influenza is believed to be responsible for the infection by *Aspergillus fumigatus* in the case described.—B. C.

486. *Einige bemerkenswerte Beobachtungen zur Pathologie der Grippe.* (*Several noteworthy Observations on the Pathology of Grippe.*) M. SCHMIDTMANN. Virchow's Arch. f. Path. Anat. (etc.), Berl., 1920, **228**, 44–50.

The author shows that in addition to the ordinary lesions in this disease there are proliferations of the flattened epithelium of the alveoli of the lung with a metaplasia of the bronchial epithelium into transitional as well as squamous epithelium—S. A. G.

487. *Metastatische Paranephritis nach Grippe.* (*Metastatic Paranephritis following Influenza.*) WILH. BOECKER. München. med. Wchnschr., 1920, **67**, 1149.

A case is described in which the patient after recovering from influenza developed a paranephritis. Operation revealed an abscess near the pelvis of the kidney. The pus was full of pneumococci. It is believed that the infection was of hematogenous origin.—B. C.

488. *Ueber Augenkrankheiten bei Grippe, II.* (*Ophthalmopathies in Influenza, II.*) EUGEN FRAENKEL. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1182–1183.

Post mortem examination in 132 influenza cases showed 46 with eye involvement consisting of hemorrhages, but apparently not associated with bacterial invasion. The damage was mainly to the retina, but both eyes were not equally affected. It is important to determine if this is a sign of grave prognosis.—B. C.

TUBERCULOSIS

(*See also Numbers 371, 384, 483, 548*)

489. *Sechsjährige Erfahrungen bei der Behandlung der Lungentuberkulose mit den Partialantigenen nach Deycke-Much.* (*Six Years' Experience in Phthisiotherapy with the Partial Antigens of Deycke-Much.*) A. OTT. München. med. Wchnschr., 1920, **67**, 1139–1141.

The results following treatment of 489 cases with Deycke-Much's partigens are tabulated below:

Stage of the Disease	*Successfully Treated*
First, 32 per cent	62 per cent
Second, 26 per cent	56 per cent
Third, 42 per cent	23 per cent

For comparison there are tabulated below the results previously obtained with the use of Old Tuberculin in 420 cases:

Stage of the Disease	*Successfully Treated*
First, 34 per cent	68 per cent
Second, 30 per cent	54 per cent
Third, 36 per cent	26 per cent

It is concluded that partial antigens are not entirely harmless, that they do not exceed tuberculin in therapeutic effect, and that the theoretical foundation of the therapy is unsound. —B. C.

490. *Studies on Immunity to Tuberculosis. A Description of Graphic Records of the Local Allergic and Immune Reactions to Tuberculous Reinfection in Guinea Pigs.* ALLEN K. KRAUSE AND DOROTHY PETERS. Am. Rev. Tuberc., Balt., 1920, **4**, 551–561.

The purpose of this communication is to emphasize the phenomena of local allergy and immunity to tuberculosis. Two plates are shown, one of which presents the development of local lesions in guinea pigs which were primarily infected in the skin (intracutaneously) with virulent, living human tubercle bacilli. At the time of infection the animals were non-tuberculous and normal. The animals were observed for 9 weeks with the following outstanding features: the absence of any immediate reaction, the sluggish development of tubercles and the progressive course of tubercles after they came to view.

The other plate shows the response to virulent infection in guinea pigs which received reinfection intracutaneously. These animals had previously been inoculated with human tubercle bacilli of low virulence, infections which served to render them allergic and immune. A type of anatomic reaction which is fundamentally different and which runs a different course from the other set of animals is brought out. In contrast to the latter there is here observed a rapid acute inflammation, an accelerated development of nodule (tubercle) and a tendency of the lesion to reach its fullest development soon and then retrogress. All these features are discussed in more detail in the text.—T. G. H.

491. *Studies on Immunity to Tuberculosis. The Results of Virulent Reinfection into Tuberculin-reacting Areas (Skin) of Tuberculous Guinea Pigs.* ALLEN K. KRAUSE AND H. S. WILLIS. Am. Rev. Tuberc., Balt., 1920, **4**, 563–591.

These experiments originated in a desire to study the part played by inflammation in hindering or abetting tuberculous infection. Inflammation was initiated by the injection of tuberculin into sensitized guinea pigs; these inflamed areas were then inoculated with tubercle bacilli. Seventy guinea pigs were infected in the right groin with a culture of tubercle bacillus of low virulence (RI, Saranac Laboratory). After 35 days they were injected intracutaneously with tuberculin, some on the left side and some on the right side. The skin reactions on the same side as the infection began as virgorously as those on the opposite side but did not reach as high a maximum and subsided more quickly.

The pigs receiving tuberculin were divided into three lots according the administration of tuberculin four, two and one days previously; these were given intracutaneously into the inflamed region 0.1 cc. of a suspension of virulent human tubercle bacilli. For controls, were a fourth group of pigs having received the initial inoculation but no tuberculin, and a fifth group of normal pigs, all of which were injected intracutaneously as above. In 24 hours none of lots 1, 2 or 3 which received tuberculin showed any marked change, lot 4 showed a typical allergic reaction while lot 5 showed no change. By the end of 9 weeks, all the normal controls (lot 5) were thoroughly tuberculous; lot 4, previously receiving an immunizing injection of avirulent tubercle bacilli but no tuberculin showed great resistance to reinfection; lot 1, which received the reinoculation 4 days after tuberculin showed more infection than lot 4, while lots 2 and 3, with reinoculation two and one days, respectively, after tuberculin, showed considerably more infection than lot 1. Fifteen pages of tables give results in detail.—T. G. H.

492. First Infection with Tuberculosis by Way of the Lungs. EUGENE L. OPIE AND HANS ANDERSEN. Am. Rev. Tuberc., Balt., 1920, **4**, 629–640.

Almost all persons dying from causes other than tuberculosis show lesions in the lungs having the character of tuberculosis of childhood,—that is occurring as foci in the substance of the lung and not more frequently in the apices. Apical lesions increase with increasing age; rarely are they found before 10 years of age, between 10 and 18 years the incidence is 11 per cent; between 18 and 50 years it is 14 per cent in persons dying from causes other than tuberculosis, while above fifty years it is much increased. Eighty-six adults dying from all causes were X-rayed at autopsy and divided into four classes according to the extent and location of lesions. Autopsy records and four plates are given to illustrate the points brought out. The distinction between latent and clinical tuberculosis, which is so often made, has no other basis than the limitations of diagnostic methods and the tendency of tuberculosis to proceed to recovery.—T. G. H.

493. First Infection with Tuberculosis by Way of the Intestinal Tract. EUGENE L. OPIE. Am. Rev. Tuberc., Balt., 1920, **4**, 641–648.

While in St. Louis among 93 autopsies on children and 50 autopsies on adults no healed mesenteric tuberculosis was found, in British soldiers autopsied during the war they were present in 18 out of 66 cases. The greater incidence of tuberculosis in cattle in England may be the cause. Autopsy records and three plates are presented for illustration.

The evidence available indicates that first infection with tuberculosis does not uniformly prevent a second infection but modifies its course so that it tends to become chronic and exhibits little tendency to become disseminated.

Lesions of the intestine, corresponding to those of the mesenteric lymph nodes, doubtless tend to disappear; for caseous material within an intestinal ulcer is rapidly disintegrated and removed. In one instance, namely in autopsy 13, a calcified nodule was found in the intestinal mucosa of the ileum.

When healed lesions are present in the mesentery focal tuberculosis of the lungs is seldom found. First infection with tuberculosis may occur by way of the lungs or by way of the gastrointestinal tract; and the occurrence of one lesion tends to prevent the other.—T. G. H.

494. The Purine Bases of the Tubercle Bacillus. ESMOND R. LONG. Am. Rev. Tuberc., Balt., 1921, **4**, 842–846.

The purine bases, guanine and adenine, were isolated in pure form from two groups of tubercle bacilli, one grown on glycerol broth, the other on a simple medium containing NH_4Cl as the sole source of nitrogen. The amounts isolated were, respectively, 0.4 per cent and 0.7 per cent of the dry weight of the organisms, from which it may be calculated that the nucleic acid content is between 2 per cent and 3.5 per cent, using the Levene and Jacobs formula, and assuming that the Kruger-Solomon method of purine isolation is approximately quantitative. Xanthine and hypoxanthine were absent, a fact which indicates that little autolysis had occurred during the two months of growth of the cultures, the purines present being those of the intact nucleic acid molecule. No purines were detected in the filtrate from the bacteria. The amino acids, tyrosine and tryptophane, were readily identified in the bacteria grown on NH_4Cl and glycerol. The total benzene soluble material was 27.2 per cent. The filtrate from these bacteria was a potent tuberculin, but failed to show the presence of dissolved protein by any of the characteristic color tests.—T. G. H.

495. Composition chimique du bacille tuberculeux. (Chemical Composition of the Tubercle Bacillus.) A. GORIS. Ann. de l'Inst. Pasteur, Par., 1920, **34**, 497–546.

The author reports the results of numerous chemical analyses of large quantities of dried tubercle bacilli, composed of a mixture of human and bovine strains. In some of the extraction experiments he used 1180 grams of dried bacilli. The work was divided into studies of the lipoidal, organic and inorganic constituents of the tubercle bacillus, and an investigation of the basis of its acid-fast staining reaction. Each section of the report presents an extensive literary review preceding the account of the author's own researches. In the description of the latter, details of all physical and chemical processes used are set forth.

He found that the fatty, waxy or lipoidal substances of the bacillus comprised:

1. *Hyalinol.* This substance was discovered by the author. It is obtained by evaporation of a purified chloroform extract. It is an elastic, clear substance, containing in percentages: carbon 55.5, hydrogen 7.5, oxygen 37.55. On decomposition with HCl it yielded crotonic and isocrotonic acids.
2. A waxy mixture containing 2 alcohols: *mykol*, m. p. 65°C. and another alcohol with a melting point of 100°C.; fatty acids (palmitic and stearic); and a *phosphatide*. Cholesterin could not be isolated, although it was thought that a trace of this substance was closely associated with mykol. The phosphatide was considered to be lecithin.
3. Among the fats extracted, the glycerides of oleic, stearic, palmitic, arachidic, carproic and butyric acids were recognized, and also myristic and "isocetic" acid.

Among the non-lipoidal organic substances, the author found a substance soluble in water, precipitable by alcohol, giving reactions analogous to tuberculin, which he considered to be "nucleo-albumin." Tyrosin and tryptophane, with other amino acids, arising from the metabolism of the bacilli, were found in the fractions soluble in water and not precipitable by alcohol.

The ash residue of the tubercle bacillus was 2.5 per cent of the weight, of which the phosphates formed the major part. The sulphated were next in amount. Compounds of sodium, potassium, calcium and magnesium were also present.

The resistance of the tubercle bacillus to decolorization by acids after being stained was found to be due to certain lipoidal constituents, notably the free fatty acids, the waxes and particularly the wax known as kymol.—S. B-J.

496. *The Primary Toxicity of Certain Preparations from Tubercle Bacilli for Mice and Guinea Pigs.* H. J. Corper and M. Moore. J. Infect. Dis., Chicago, 1920, **27**, 499–502.

In the preparation of autolysates and distilled water extracts of tubercle bacilli, the organisms were obtained from glycerol broth cultures about 7 to 9 weeks old. The cultures were washed with 4 changes of sterile 0.9 per cent NaCl solution of pH 7. Four cubic centimeters of the emulsion of bacilli were placed in each of several 15 cc. graduated centrifuge tubes, 10 cc. of sterile neutral salt solution (0.9 per cent) added to the tubes intended for autolysation, or 10 cc. of neutral distilled water to the tubes for the preparation of the aqueous extract or "water-lysate." The autolysate was prepared by placing the bacilli in salt solution in the incubator at 37°C., and keeping them there, shaking them daily for 2 weeks. The supernatant fluid was then obtained by high speed centrifugation. This, preserved on ice, was used for toxicity tests in mice and guinea pigs. The "water-lysate" was prepared by placing the bacilli in distilled water in the incubator at 37°C. for 12–24 hours, when they were placed in the ice box for 2 weeks. The supernatant extract was obtained by centrifugation, made isotonic with NaCl, and used in certain toxicity experiments.

The experiments showed that neither of these preparations was toxic. Neither the autolysate nor the extract in distilled water of virulent human and bovine tubercle bacilli possessed any toxicity for mice when injected intraperitoneally in a single dose of 2 cc. or daily for 9 days in a dose of 1 cc. A single injection of 10 cc. into the peritoneal cavity of a guinea pig was not toxic.—S. B-J.

497. *Weight Curves of Tuberculous Guinea Pigs. Studies on the Biochemistry and Chemotherapy of Tuberculosis. XX.* L. M. DeWitt. J. Infect. Dis., Chicago, 1920, **27**, 503–512.

The weight curves of guinea pigs are reproduced in charts showing that normal guinea pigs of approximately the same age and weight living under the same conditions have a regular rate of growth. Variations in diet, infections, peculiar breaks in the ascent of the curve, rounded or plateau-like apices alter the shape of the normal weight curve. The general type of curve, however, is sufficiently common to serve as a standard for measuring the general condition of the animal.

Guinea pigs inoculated with tubercle bacilli show uniform and characteristic changes in the weight curve. The weight curve, therefore, may be used in testing the effect of various methods of treatment, and is a better guide in the study of the effects of chemotherapy on animals than the usual criterion based upon the duration of life.—S. B-J.

498. *Tuberkulosestudien, I. Ueber die Differenzierung säurefester Bakterien.* (*Tuberculosis Studies, I. The Differentiation of Acid-fast Bacteria.*) H. Schlossberger and W. Pfannenstiel. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1213–1214.

Attempts were made to differentiate strains of genuine tubercle bacilli from apathogenic, morphologically similar acid-fast bacilli. Ziehl-Neelsen and Konrich stains permitted no differentiation. Neither did serum agglutination nor acid agglutination, nor the growth on carbohydrate media. The optimal temperature, and the temperature limits for growth sharply differentiated the two groups. True tubercle bacilli (excepting the atypical Arloing strain) do not grow at a temperature above 42°, while the non-pathogenic acid-fast bacilli are able to grow at 50° and some at 55° and 58°. Genuine tubercle bacilli of cold-blooded animals do not grow at 37°, consequently, the turtle strains of Friedmann and of Piorkowski which flourish at this temperature cannot be considered as members of that group.—B. C.

499. *Versuche mit Tuberkulinen verschiedenen Typus.* (*Experiments with Tuberculins from Different Types.*) Daniel Schuster. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1102–1104.

It was found clinically that tuberculous persons gave different and often conflicting reactions not only with tuberculins from different types, but also with tuberculins of the same type of bacillus but of different origin. Even more conflicting were the results following repetition of injections with the same tuberculin. No close constant relation between the disease and any tuberculin could be established by the reaction. It is claimed to be impossible from the type of reaction to make a differential diagnosis as to the constitution of the infecting virus and thereby suggest an indication for a differential therapy. Animal experiments also indicate that the toxin content of a tuberculin determines largely the extent of the tuberculin reaction even in man, and that the difference in reaction with different tuberculins is determined mainly by the differing toxin content of the preparations.—B. C.

500. *Immunisierungsversuche gegen Meerschweintuberkulose mit artfremden Antigenen.* (*Immunization Experiments against Guinea Pigs Tuberculosis with Heterogeneous Antigens.*) W. Böhme. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1187.

Experiments with a bacterial autolysate 'vaccineurin' were completely negative. Treatment with living cultures of *Trichophyton tonsurans* was also without result, except to delay death by about 12 days. Influenza bacilli, pus and milk were each tried without success. Whatever improvement was noted is to be ascribed to a non-specific effect which was not very significant.—B. C.

501. *A Roentgenological Study of Influenza, with Recovery, in an Advanced Case of Pulmonary Tuberculosis.* Louisa T. Black and Mary Moore. Am. Rev. Tuberc., Balt., 1920, **4**, 654–658.

Tuberculosis, being a chronic disease, is susceptible to multiple individual and combined influences, and there is bound to be a difference of opinion among clinicians with regard to any single factor. Certain types of inflammation, such as those produced by Corper with croton oil, turpentine, capsicum and cantharidin, do not seem to accelerate tuberculosis in the guinea pig. As to influenzal bronchopneumonia there has been no acceleration of the tuberculous process in the lungs 5 months after the influenza.—T. G. H.

502. *Conditions Commonly Mistaken for Pulmonary Tuberculosis. Report of a Study of 1700 Consecutive Cases.* B. Stivelman. Am. Rev. Tuberc., Balt., 1921, **4**, 856.

Among 1700 cases sent to the sanatorium 176 or 10.4 per cent were non-tuberculous. The conditions most frequently diagnosed incorrectly were: Chronic bronchitis and emphysema, cardiac conditions, nonspecific diseases of the upper respiratory tract, neurasthenia, chronic interstitial pneumonia, bronchiectasis, chronic non-tuberculous lung infections, asthma, gastric ulcer, pulmonary abscess, dysthyroidism.

The diagnosis of tuberculosis in individuals over 50 or those suffering from mitral disease is hazardous unless positive sputum or X-ray findings are obtained. It is safe to consider lesions confined to the lower lobe as non-tuberculous until proved otherwise. Marital phthisis is rare, tuberculosis in one consort having no etiological relationship to tuberculosis in the other. Extensive unilateral lesions are often non-tuberculous while advanced tuberculosis is usually bi-lateral. Positive sputum reports are not incontestable—the presence of acid fast bacilli should be confirmed by other symptoms. Accurate diagnosis and intelligent treatment call for care and thoroughness, sputum studies, roentgen ray, and proper correlation of history, symptoms and physical findings.—T. G. H.

503. *Stoffwechseluntersuchungen bei schweren afebrilen Tuberkulosen.* (*Metabolism Studies in Severe Afebrile Tuberculosis.*) E. Grafe. München. med. Wchnschr., 1920, **67**, 1081–1083.

Results of examinations in 15 cases are tabulated. Most of the patients showed a gross metabolism of 20 to 36 per cent above the normal. Food intake to balance this output should be at a level of 50 to 55 calories per kilo for afebrile cases, and 60 to 65 for the febrile.—B. C.

504. *Welche Bedeutung hat die Unterscheidung zwischen offener und geschlossener Lungentuberkulose für die Bekämpfung der Tuberkulose?* (*What Significance for the Campaign against Tuberculosis has the Differentiation between Open and Closed Pulmonary Tuberculosis?*) E. Hartmann. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1168–1169.

Sputum examinations are not very reliable; and a negative finding does not necessarily mean that the sputum is non-infectious. The division of tuberculosis into "open" and "closed" classes is not justified clinically, nor is it practically valuable. According to the author, tuberculosis is either active or healed.—B. C.

505. *A Preliminary Report of a Study of the Goetsch Test.* R. McBrayer. Am. Rev. Tuberc., Balt., 1920, **4**, 616–619.

This study was conducted on 55 patients. The object of the investigator is to shorten the method of Goetsch so that the busy practitioner may utilize the method. Progress is reported.—T. G. H.

506. *Adrenalin Hypersensitiveness in Definite and Unproved Pulmonary Tuberculosis.* **Fred H. Heise and Lawrason Brown.** Am. Rev. Tuberc., Balt., 1920, **4**, 609–615.

The adrenalin tests were conducted, under the direction of Dr. Goetsch, upon 260 patients at the Trudeau Sanatorium.

"1. The adrenalin reaction was twice as frequent in the nontuberculous as in the tuberculous cases (14 per cent and 29 per cent respectively).

"2. Activity of the pulmonary focus, as determined by symptoms, played little if any part in occurrence of the adrenalin reaction (11 per cent as against 13 per cent).

"3. Adrenalin hypersensitiveness apparently has no direct relation to the occurrence of a positive or negative complement fixation for tuberculosis (16 per cent and 19 per cent respectively).

"4. Presumptive inactivity as interpreted from the X-ray was accompanied by adrenalin hypersensitiveness about two and one-half times as often as when activity was present.

"5. The occurrence of tubercle bacilli seemed to be associated with a less frequent adrenalin reaction than when tubercle bacilli were absent (10 per cent and 17 per cent respectively).

"6. The occurrence of a history of hemoptysis or of dry pleurisy seemed to bear no relation to the adrenalin reaction (17 per cent and 14 per cent respectively).

"7. No case with history of pleurisy with effusion reacted to adrenalin.

"8. As the extent of disease becomes greater, the tendency to react to adrenalin apparently diminishes (27 per cent, 15 per cent, 9 per cent).

"9. Susceptibility to tuberculin subcutaneously has apparently no relation to adrenalin hypersensitiveness, when tuberculosis is present. However, when pulmonary tuberculosis is absent, the adrenalin reaction is less apt to occur when there is tuberculin susceptibility.

"10. Tuberculous colitis apparently does not promote adrenalin hypersensitiveness."—T. G. H.

507. *Hypernephrectomy and Experimental Tuberculosis.* **G. B. Webb, G. B. Gilbert, J. B. Hartwell and C. T. Ryder.** Am. Rev. Tuberc., Balt., 1920, **4**, 605–608.

This study deals with the removal of one adrenal in guinea pigs and the effect of this operation on resistance to a subsequent inoculation with tubercle bacilli. No apparent difference could be demonstrated in resistance between pigs thus treated and normal control pigs when injected with virulent tubercle bacilli.—T. G. H.

508. *The Effect of Artificial Pneumothorax on Pulmonary Tuberculosis in the Rabbit.* **H. J. Corper, Saling Simon and O. B. Rensch.** Am. Rev. Tuberc., Balt., 1920, **4**, 592–604.

"1. One-sided artificial pneumothorax or compression of one of the lungs of the rabbit by means of fluid, artificial hydrothorax, has no visible macroscopic influence upon the number or type of the tuberculous lesions resulting from the intravenous injection of virulent human tubercle bacilli, regardless of whether the compression is occasioned on the right or the left side, or whether it is occasioned a day before or a day after the intravenous injection of the tubercle bacilli. These results disagree with those of Shaw who maintains that compression favors the development of the tuberculosis in the compressed as compared to the other lung. There were also noted no differences between the number or type of the tuberculous lesions in animals with one lung compressed as compared with normal animals, not compressed, although the differences between the different animals of the same series receiving the same intravenous injections of tubercle bacilli were greater than the differences found between the two lungs of the same animal.

"2. Suspensions of Prussian blue, Scarlet R and starch, injected intravenously into rabbits shortly (within one-half hour) after a right-sided closed pneumothorax, were found uniformly distributed throughout the lungs immediately after injection and up to two hours thereafter. The gradual disappearance of Prussian blue within that time occurred uniformly on both sides and would not tend to support Bruns, who maintained that the circulation was lessened in the compressed lung as opposed to Cloetta who maintained an equal (or even better circulation) in the pneumothorax lung as compared with the other lung."—T. G. H.

509. *Experimental Lesions of the Lungs Produced by the Inhalation of Fluids from the Nose and Throat.* **W. V. Mullin and C. T. Syder.** Am. Rev. Tuberc., Balt., 1920, **4**, 683–687.

India ink or suspensions of tubercle bacilli in amounts of about 1 cc. were allowed to flow by means of a pipette into the nostrils of rabbits. The pigmentations or tuberculous lesions produced corresponded very closely in distribution to the lesions of pulmonary tuberculosis in man.—T. G. H.

510. *A Comparison of Gross Tuberculous Lesions in Whites and Negroes, as Based on 150 Autopsies.* **J. B. Rogers.** Am. Rev. Tuberc., Balt., 1920, **4**, 669–675.

The study was made on 75 white cases and 75 colored cases at autopsy.

"Comparative study of the pathologic lesions in negroes and whites dying from pulmonary tuberculosis shows no essential difference in type or extent; the majority can be classified as of the chronic ulcerative type.

"A minor number of cases, both colored and white, suffer from the more acute puerile type of generalized tuberculosis, this condition apparently being more common in the negro than in the white race."—T. G. H.

511. *Tuberculosis Among the Negroes.* H. G. CARTER. Am. Rev. Tuberc., Balt., 1920, **4**, 676–682.

"Tuberculosis is a disease of civilization and its eradication is to be accomplished by perfection in the standards of living of this civilization.

"Data carefully compiled by us show that the mixed type of Negro has a better resistance to tuberculosis than the pure-bred Negro. Observations show, however, that shade of mentality counts for more than does shade of color.

"Hook-worm as a complication of tuberculosis in the Negro race is quite uncommon. Syphilis is a common complication and syphilis of the lungs as evidenced by the therapeutic test is not rare.

"As the eradication of tuberculosis in the future depends upon the prevention of childhood infection, the treatment of the Negro is a vital health problem in the South today on account of the fact that his occupation in 50 per cent of cases throws him into intimate contact with children other than his own, thereby affording a double chance to infect childhood."—T. G. H.

512. *Masked Juvenile Tuberculosis.* J. V. COOKE AND T. C. HEMPELMANN. Am. Rev. Tuberc., Balt., 1920, **4**, 660–668.

Because of the high rate of tuberculosis among adults these authors were led to study children by aid of the complement fixation test for evidences of the disease. One hundred and thirty-one children with no manifest evidences of tuberculosis were chosen.

Table showing result of complement fixation tests in masked juvenile tuberculosis

AGE IN YEARS	TOTAL NUMBER	NUMBER OF POSITIVE FIXATIONS	PERCENTAGE OF POSITIVE FIXATIONS
0–1	0	0	0
1–2	5	2	40
2–4	10	5	50
4–6	19	12	63
6–9	45	33	73
9–12	31	23	74
12–15	21	20	95
Total..............	131	95	73

One of three things happens to children with masked juvenile tuberculosis—they overcome the infection (the most common), they develop open symptoms of tuberculosis, or they retain the masked lesions to adult life when they develop open symptoms. The diagnosis of masked tuberculosis in children therefore is of great importance so that antituberculosis measures may be instituted early, and in this work the complement fixation test is of great assistance.—T. G. H.

DISEASES OF CHILDREN

(*See also Numbers 398, 524, 557*)

513. *Diphtheria in the Philippine Islands.* LIBORIO GOMEZ, AMANDO M. KAPAUAN AND CATALINO GAVINO. Philippine J. Sc., Manila, 1920, **17**, 37–53.

From a study of the incidence, clinical symptoms, bacteriology, pathology and mortality of diphtheria, the authors conclude that diphtheria in the Philippines shows practically the same clinical manifestations and bacteriological and pathological findings as in other countries.—M. W. C.

GYNECOLOGY AND OBSTETRICS

(*See also Number 466*)

514. *Autoinfection, So-Called, During the Puerperium.* G. RUSTIA. Philippine J. Sc., Manila, 1920, **17**, 119–123.

Bacteriological examination of the secretion from the cervix uteri and posterior cul de sac before and after delivery in a series of 80 patients showed that of 15 strains of hemolytic streptococcus found antepartum, 11 were *Streptococcus pyogenes* (Holman). Of these 11, 4 were the cause of infection during the puerperium. Of 3 nonhemolytic streptococci isolated antepartum, 1 caused fever during the puerperium.

The author concludes from the above findings that autoinfection is an important factor in puerperal infection.—M. W. C.

515. *Spätperitonitis im Wochenbett.* (*Late Peritonitis during Labor.*) M. HEUKEL. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1133–1134.

A case is described which ended fatally. The usual symptoms of peritonitis were lacking. Autopsy findings demonstrated a streptococcus peritonitis. In the absence of direct evidence, the author assumes that influenza was responsible in this case, because an epidemic was at the same time prevalent.—B. C.

DERMATOLOGY

(*See also Numbers 382, 474, 552, 555*)

516. A Contribution to the Study of Epidermophyton Inguinale. G. W. Wende and K. R. Collins. Arch. Dermat. & Syph., Chicago, 1921, **3**, 1–13.

The frequent occurrence of lesions outside of the inguinal region is noted. The appearance of the lesions varies greatly, which may be attributed to environment.

There are many cultural types without any corresponding pathologic variation. This phase has not previously been reported.—R. D. H.

517. Penicillium brevicaule Var. hominis Saccardo, in an American Case of Ringworm of the Toes. F. D. Weidman. Arch. Dermat. & Syph., Chicago, 1920, **2**, 703–715.

A review of previous reports is given. The case reported is emphasized as the first occurrence in an American. The *P. brevicaule* was isolated once out of three trials. It was not pathogenic for animals. Microscopic and cultural characteristics are given.—R. D. H.

518. Zur Behandlung Zirkumskripter pyogener Infektionen, speziell der Furunkulose und des Karbunkels, durch meine Methode der Vereisung. (Treatment of Circumscribed Pyogenic Infections, especially Furunculosis and Carbuncles, by my Method of Freezing.) Ph. Bockenheimer. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1158–1159.

An ethyl chloride spray is used, producing first an active and later a passive hyperemia. Pain and discomfort are reduced and healing is accelerated with almost imperceptible fibrosis.—B. C.

519. Urticaria tuberosa (Willan). F. Reiche. München. med. Wchnschr., 1920, **67**, 1044.

A case is described in which the symptoms suggested a form of "nodular" rheumatism but differed from the latter in that the nodules were inconstant in localization, reappearing during the evening and disappearing again. The etiology of this rather uncommon form of urticaria seems obscure. It is suggested to be of neurogenic origin.—B. C.

520. Die Esophylaxie der Haut und Infektionskrankheiten. (Esophylaxis of the Skin and Infectious Diseases.) H. Menze. München. med. Wchnschr., 1920, **67**, 1111–1115.

Absolute immunity is a histogenic immunity and a function of the ectoderm. Esophylaxis of the skin may be spoken of only as a subdivision of the histogenic, ectodermal, absolute immunity. It is produced by chemical reactions between invading organisms and the ectodermal cells, or between toxins and these cells. These reactions are specific and the result cannot be considered an internal secretion even in the general sense of the term. Protective bodies elaborated by epidermal cells are produced only in diseases caused by ectodermotropic invaders. In tuberculosis, the mesenchymal portions of the skin, not the epithelial, are involved in the production of an "inner secretion" of antibodies.—B. C.

521. Ueber lokale Infekte der Aphthenseuche. (Local Inflammations in Foot and Mouth Disease.) Hubert Sieben. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1195–1196.

Three cases are cited of human infection with the disease. The striking feature was the absence of furuncles and edema of the skin. Fever was present but the typical lesions did not appear on the mucosa.—B. C.

522. Ueber Maul- und Klauenseuche beim Menschen. (Foot and Mouth Disease in Man.) Hans Kopf. München. med. Wchnschr., 1920, **67**, 1043.

A case of this infection is described in a soldier who had acquired it, presumably, while sleeping in a cattle stall.—B. C.

523. Zur Pockendiagnose. (Smallpox Diagnosis.) Erich Becker. München. med. Wchnschr., 1920, **67**, 1117–1118.

Diagnosis is recommended on the basis of the presence of so-called Paschen's bodies in smears from a preferably non-purulent variolar pustule. A pustule is carefully opened and its contents streaked thinly on a clean slide. This slide is air-dried, and placed vertically in distilled water for 15 minutes. The slide is again air-dried (it must not be blotted), fixed for 2 to 3 minutes in methyl alcohol and air-dried once more. The preparation is then covered with Loeffler's stain and heated over a flame until the appearance of light vapors. It is then rinsed with water, and counterstained with filtered Ziehl's fuchsin solution applied like the first stain. The slide is then rinsed and air-dried. Paschen's bodies are very small round granules, uniform in size, and found in great numbers in the colorless or pink background. Their appearance is quite characteristic and specific. These observations are based on an experience of 8 years.—B. C.

524. A case of Pemphigus Neonatorum. Ralph Cox. Practitioner, Lond., 1920, **105**, 301–302.

History of a case in which the lesions of pemphigus appeared the fourth day after delivery.—C. P. B.

525. Vaccines in the Treatment of Cutaneous Diseases. J. M. H. MacLeod. Practitioner, Lond., 1920, **104**, 338–343.

This is a general article, only fair results were obtained.—C. P. B.

OPHTHALMOLOGY

(*See also Number 488*)

526. *Ueber gramnegative Mikrokokken als Erreger einer Panophthalmie.* (*Gram-negative Micrococci as the Cause of Panophthalmia.*) F. W. Bach. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **84**, 214–223.

In a case of postoperative panophthalmia the causal organism isolated was a Gram-negative micrococcus. It did not agree in its cultural characters with any of the previously described strains of Gram-negative cocci.—R. E. B.

527. *Zir Wirkung der Iontophorese bei Augenleiden. Erfolgreiche Aufhellung der Maculae corneae.* (*Ionic Medication in Ophthalmopathies. Successful Clearing of Corneal Opacities.*) Gustav Erlanger. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1107–1109.

Cataphoresis of medicament induced by electric current is said to be of peculiar value in eye diseases. Use was made of the bactericidal and trophically stimulating zinc ion in corneal infections. Chlorine and iodine ions stimulate resorptive tissue changes.—B. C.

OTOLOGY AND NOSE AND THROAT DISEASES

(*See also Number 468*)

528. *The Etiology of Acute Inflammations of the Nose, Pharynx and Tonsils.* Stuart Mudd, Samuel B. Grant and Alfred Goldman. J. Lab. & Clin. M., St. Louis, 1921, **6**, 175–190.

After a brief introduction the authors discuss the bacteriology of the common cold and excessive chilling as an excitant of infection, reporting experimental studies of vasomotor reactions of human subjects to chilling of the body surface. The authors after a survey of the literature conclude that there is a common and clearly defined clinical entity, an acute coryza caused by the filterable virus of Kruse and Foster, which is easily communicated and depends to no great extent upon the action of any factors in depressing the resistance of the subject. Also there is a group of pure and mixed infections of the upper respiratory tract with various clinical pictures; the bacteria whose etiologic rôle in these cases seems best established are: pneumococcus, streptococcus, *B. diphtheriae*, *B. rhinitis*, Friedländer's bacillus and *B. influenzae*. Strong evidence has also been advanced for *M. catarrhalis*, *B. septus*, *M. paratetragenus*, and *S. aureus*. In this second group of infections of the nose, pharynx and tonsils some of the organisms are doubtless capable of causing widespread epidemics almost or quite independent of accessory exciting causes while others are infective only after the local or general resistance of the host has been lowered by some exciting factor. —F. W. H.

529. *Ueber die fusospirilläre Assoziation bei Otitis media.* (*The Fusospirillar Association in Otitis Media.*) Hartwich. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **84**, 535.

A case history is given of a patient in which spirochetes and fusiform organisms were found present in the middle ear associated with otitis media. Similar organisms were found upon the tonsils.—R. E. B.

ORAL BACTERIOLOGY

530. *Remote Manifestations of Focal Dental Infections, with Case Reports.* Ricardo Fernandez. Philippine J. Sc., Manila, 1920, **16**, 89–98.

The importance of focal dental infections in certain articular and muscular affections is emphasized. A report is made of 10 cases having rheumatic symptoms, in all of which there were found pyorrhea or abscesses of the teeth. Removal of the focus of infection together with administration of autogenous vaccines resulted in marked improvement or recovery. —M. W. C.

531. *Primäre Zungenaktinomykose.* (*Primary Lingual Actinomycosis.*) Kockel. München. med. Wchnschr., 1920, **67**, 1044.

A case is described in a man 40 years old. The lesion suggested a sarcomatous growth until there was discovered in the center a small splinter surrounded by an actinomycotic mass. The infection was evidently due to the habit of the patient of chewing toothpicks.—B. C.

SEROLOGY

(*See also Numbers 376, 377, 478, 480, 481*)

532. *The Transmission of Specific Immune Bodies from the Mother to the Young.* K. M. Howell and H. Eby. J. Infect. Dis., Chicago, 1920, **27**, 550–556.

Pregnant rabbits were immunized to human and sheep red cells, and to bacteria, and estimations of the antibodies contained in their sera and in those of their young were made at intervals after parturition. No attempt was made to determine whether or not antibodies were transmitted through the milk of the mothers.

Anti-sheep and anti-human hemolysin was decreased in immunized rabbits after parturition. The serum of their offspring contained these specific hemolysins but in lower titer. There was little hemolysin in the serum of the young at the end of the sixth week and none at the end of the eleventh week.

"Complement fixing antibodies" to *Streptococcus viridans*, pneumococcus, Type II, meningococcus and *B. typhosus* were present in the blood of pregnant rabbits immunized to these bacteria, but almost disappeared after parturition. Complement fixing antibodies were detectable only in the serum of the rabbits born of a mother immunized to *B. typhosus*, and persisted in these young rabbits for only 2 weeks.

Agglutinins for meningococcus and *B. typhosus* persisted after parturition in the serum of animals immunized to these microorganisms, and were recognizable, in lower titer, in the serums of their offspring during 4 weeks after birth.

Specific opsonins occurred in the serum of offspring of immunized mothers, but in low titer, during a period of 5 weeks after birth.—S. B-J.

533. A Simple Method for the Removal of Natural Amboceptor from Human Sera. R. L. Kahn. J. Lab. & Clin. M., St. Louis, 1921, **6**, 218–220.

Kahn adds one drop of packed cells to 1 cc. of inactivated serum and allows the absorption to take place for 10 minutes at room temperature. The drop is of such size as to require 25 to 30 drops to the cc. Kahn's experiments show the method to be efficient and also that the absorbed serums do not become anticomplementary after 10 minutes' extraction. The procedure also has the advantage of causing but a negligible delay in the completion of the tests.—F. W. H.

534. Études sur la précipitation mutuelle des anticorps et des antigènes. Troisième mémoire. Sérums anticellulaires. Valeur pratique de la réaction précipitante. (Studies of the Mutual Precipitation of Antibodies and Antigens. III. Anticellular Serums. Practical Value of the Precipitin Reaction.) M. Nicolle and E. Cesari. Ann. de l'Inst. Pasteur, Par., 1920, **34**, 709–714.

This is a general discussion of the practical value of the precipitin reaction. The usual application of the test to identify an antigen or antibody is admitted, while attention is called to the group reactions which related bacteria show. For example, the authors have found that an antistreptococcus serum will precipitate the extract of a Type II pneumococcus. The precipitin titer of a serum has been found to parallel the agglutinating and antitoxic powers of the serum. Precipitin content, however, gives no indication of the bacteriolytic power of a serum.

Details of the experiments on which these conclusions are based are not given in this paper. —S. B-J.

535. The Production by Streptococcus hemolyticus of an Agglutinin for Red Corpuscles which Inhibits Hemolysis. K. M. Howell. J. Infect. Dis., Chicago, 1920, **27**, 565–568.

An apparently typical hemolytic streptococcus isolated from a vegetation on an aortic valve, readily caused hemolysis of blood cells in a blood agar plate, but in broth cultures with red cells and in the sheep-cell test recommended by the Army Medical Department for testing the hemolytic power of streptococci the organism caused the cells to agglutinate and apparently thus prevented their hemolysis. This peculiar quality was shown by this strain of streptococcus for only 6 weeks, when it lost the power to agglutinate cells and appeared then to be frankly hemolytic. The "agglutinin" was demonstrable free in the culture fluid. It resisted heat at 80°C. for 1 hour. The fragility of the red cells was not altered by the action of this agglutinin. The agglutinin affected the erythrocytes of various animals differently. It had no effect on guinea pig corpuscles, it partially agglutinated sheep corpuscles; in low dilutions (1–2) it laked human, rabbit and mouse corpuscles, while in high dilutions (1–512) it agglutinated these cells. It was thought that the agglutinin inhibited the action of the hemolysin which was also formed by this streptococcus.—S. B-J.

536. Ueber die Einwirkung verschiedener Methoden der Impfstoffbereitung auf den Agglutinationstiter der gegen Cholera und Typhus Schutzbeimpften. (The Results Secured by Different Methods of Preparation of Vaccine on Agglutination Titer of Those Vaccinated against Cholera and Typhoid.) Stanislaw Sierakowski. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **84**, 161.

The author urges that in spite of the individual variation shown in the height reached by the agglutination titer of those vaccinated irrespective of the method of preparation of vaccine, nevertheless, it is possible to secure reliable results and comparative data by the use of a sufficiently large group of individuals. The method of preparation of the vaccine must be suited to the particular characteristics of the organism. Those used in the preparation of typhoid bacteria for example, are not necessarily the best for the cholera vibrios. Vaccine prepared by heat should be preserved by the addition of some disinfectant or preservative. Glycerine was found to be useful for killing cholera organisms for vaccine but not for preservation. The higher the temperature used for killing the cholera vaccine, the smaller is the development of agglutinin in the blood of those immunized therewith. Agglutinins do not rise after the second injection of cholera vaccines higher than after the first. They disappear almost completely within six months.

All the typhoid strains gave equally good results when used in vaccine.—R. E. B.

537. Ueber Mitagglutination bie Cholera. Beitrag zur Diagnose der Cholera. (*Coagglutination in Cholera. A Contribution to the Diagnosis of Cholera.*) STANISLAW SIERAKOWSKI. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **84**, 178.

The agglutinins contained in cholera serum are absorbed by the cholera vibrio but other vibrios do not absorb this cholera agglutinin. The agglutinins of the cholera serum are not specific. The author has succeeded in dividing them into 4 groups. The agglutinins for single groups of vibrios, which are contained in the serum of rabbits immunized with these, differ from the agglutinins in cholera serum, since the cholera organism does not absorb them from the rabbit serum.—R. E. B.

538. Ueber gegenseitige Beziehungen der Agglutinine des Bazillus X19 und der Typhus- und Ruhrgruppe. (*The Reciprocal Relationship of the Agglutinins of Bacillus X19 and of the Typhoid and Dysentery Group.*) FELIX E. R. LOEWENHARDT. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **84**, 191.

It has been noted by various writers that the serum of typhus fever patients frequently shows the presence of agglutinins for various kinds of bacteria. In addition to those responsible for agglutination of the X19 strain of proteus (that is, those responsible for the so-called Weil-Felix reaction), frequently agglutinins for other kinds of bacteria particularly those of the typhoid and dysentery group may be found. The coagglutination of the typhoid group must be differentiated from that of the dysentery group. The development of the typhoid agglutinin when it appears is to be regarded usually as the reappearance of a previously produced antibody and cases of typhus which show the typhoid agglutination are to be explained thus.

Coagglutination of the dysentery group on the other hand is to be regarded as showing some antigenic relationship between X19 and the dysentery bacillus. This may be shown by saturating the serum containing both X19 and the dysentery agglutinin with X19 bacteria, the agglutinins are thereby quite completely removed. On the other hand, saturation with dysentery bacilli does not remove all the agglutinins for X19.—R. E. B.

539. Interpretation of Wassermann Reaction of Blood Serum in Mental Diseases. J. ALLEN JACKSON AND HORACE VICTOR PIKE. J. Am. M. Ass., Chicago, 1921, **76**, 360.

A positive Wassermann reaction of the blood serum indicates that the patient has come in contact with syphilis, either hereditary or acquired. It does not mean that the mental disorder from which he suffers is due to syphilis. A diagnosis of neurosyphilis should be based on neurologic signs and spinal fluid reactions, irrespective of the readings of the blood serum. Psychosis in which there is a positive Wassermann reaction of the blood serum, but showing no other serologic, neurologic or clinical evidences of syphilis does not demand antisyphilitic treatment. Antisyphilitic treatment avails nothing in well advanced paresis or tabes dorsalis. —P. G. H.

540. Interêt de la Méthode des Dilutions dans la Reaction de Bordet-Wassermann. Numeration des Unités d'Anticorps. (Σ) (*The Value of Dilutions in the Wassermann Reaction, and the Numerical Expression of Antibodies* (Σ).) EDOUARD PEYRE. Presse méd., Par., 1921, **29**, 56.

Positive sera are titrated in suitable dilutions. As unit is taken the final dilution of 1–10 (including the dilution in the performance of the test) of patient's serum, and represented by Σ. The units are calculated by dividing the highest dilution in which hemolysis is not complete into 1–10, and expressing the results as Σ. Thus, if slight inhibition of hemolysis occurred in final dilution of 1–40, and not higher, $\frac{1\text{-}10}{1\text{-}40} = 4\,\Sigma$. The enumeration of "antibodies" is of especial interest in following the course of treatment.—L. A. K.

541. Complement vs. Amboceptor Titrations in the Wassermann Test. R. L. KAHN. J. Lab. & Clin. M., St. Louis, 1920, **6**, 153.

Kahn believes the incubation period in complement and amboceptor titrations and the final period before reading the test should be the same and suggests 15 minutes as a standard. He also calls attention to the fact that a daily titration of the amboceptor and the complement is necessary to obtain a properly balanced hemolytic system.—F. W. H.

542. A Comparison of Antigens for Bacterial Complement Fixation. K. M. HOWELL AND R. ANDERSON. J. Infect. Dis., Chicago, 1920, **27**, 569–575.

To find the most suitable antigen for use in bacterial complement fixation tests, the authors compared the fixing properties of 8 different preparations of bacteria. In brief, these antigens may be characterized as follows:

Antigen 1. Autolysate of Blake, prepared by freezing and thawing bacteria in salt solution.

Antigen 2. Antiformin digestion of the precipitate caused by the addition of absolute alcohol to a bacterial suspension. (Kinsella and Swift.)

Antigen 3. Supernatant fluid from alcoholic precipitation of bacteria dissolved in antiformin. (Krumwiede and Noble.)

Antigen 4. Acetone insoluble fraction of alcoholic extract of bacteria. (Warden, Noguchi.)

Antigen 5. Autolysate of bacteria in distilled water. (Olitsky and Bernstein.)
Antigen 6. Suspension of alcoholic precipitate of bacterial emulsion. (Gay and Besredka.)
Antigen 7. Supernatant fluid of autolysate of bacteria in salt solution. (Kolmer.)
Antigen 8. Heated (56°C. for 1 hour) suspension of washed bacteria in salt solution.

The 8 antigens were made for each of the following micro-organisms: pneumococcus, streptococcus, *B. typhosus* and meningococcus. Complement fixation tests were carried out with serums of animals immunized to these bacteria. The results of the tests are reported in detail. In general, the salt solution emulsion of washed bacteria was found to be as suitable as any other antigen. Antigen 1 was most satisfactory for the test with meningococci, antigens 4 and 5 for pneumococci. It is shown that different bacteria require different preparations of the antigens for the best results in complement fixation tests.—S. B-J.

543. Observations on the Quantitative Nature of Complement Fixation. With Special Reference to the Clinical Application of Partial Wassermann Reactions. J. J. Seelman. J. Lab. & Clin. M., St. Louis, 1920, **6**, 144–153.

The author urges the need of a standard technic for the Wassermann test and of standard requirements for technicians. The error in the classical test when properly performed is on the negative side and partial reactions are always specific, he thinks. The standard test should be made more delicate without sacrificing its specificity so that the blood of cases of syphilis containing only small amounts of fixing substances shall give definite positive results in a larger percentage of instances. Seelman suggests that this be accomplished by testing all serums by the classical method modified to avoid its major sources of error and by a raw serum test so modified as to remove the sources of error inherent in the present raw serum methods. The author also outlines a scheme for the interpretation of results.—F. W. H.

544. The Complement Fixation Test for Syphilis: Incubation for Fixation at Ice-box Temperatures. Joseph W. Smith, Jr. Philippine J. Sc., Manila, 1920, **17**, 31–35.

The author recommends for the Wassermann reaction incubation at 8°C. for 4 to 24 hours, and the use of two antigens, a simple alcoholic extract and a cholesterinized extract.—M.W. C.

545. Wassermannsche und Sachs-Georgische Reaktionen bei Syphilis, II. (*Wassermann and Sachs-Georgi Reactions in Syphilis, II.*) T. Baumgärtl. München. med. Wchnschr., 1920, **67**, 1034–1036.

Parallel tests were made of the Wassermann reaction, Kaup's modification of the Wassermann reaction and the Sachs-Georgi test. These were studied in conjunction with the clinical stage of the disease at the time of test. The results show that the three reactions are to the same extent specific, varying only in their degree of sensitiveness upon dilution.—B. C.

546. Beitrage zur Serodiagnostik der Syphilis mittels der Sachs-Georgischen Ausflockungsreaktion. (*A Contribution to the Serodiagnosis of Syphilis by Means of the Sachs-Georgi Method of Flocculation.*) Ammenhäuser. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **84**, 521–528.

As a result of a comparative study of sera and spinal fluids, by the Wassermann and the Sachs-Georgi methods, the author concludes that when the tests are properly carried out there is a very close parallelism between the results secured. The most important and most difficult point in the Sachs-Georgi reaction is the preparation of a usable organ extract with an optimal cholesterin dose. The usefulness of the Sachs-Georgi reaction is therefore an extract question.—R. E. B.

547. Zur Frage der Verwendung von Pferdenierenantiserum zum Nachweise von Pferdefleisch in Würsten nach der Methode von Sachs und Georgi. (*Concerning the Detection of Horse Flesh in Wurst by the Use of Horse Kidney Anti-serum after the Method of Sachs and Georgi.*) Walter Wohlgemuth. Deutsche tierärztl. Wchnschr., 1920, **28**, 280–288; 300–303.

The author, as a result of his work, concludes that, at present, this method cannot be put to practical application. Seligman reached the same conclusion.—J. T.

548. Ueber die Verwendung des Abderhaldenschen Dialisierverfahrens bei Nierentuberkulose. (*The Application of the Abderhalden Dialysis Test in Renal Tuberculosis.*) Fritsch. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **56**, 1142–1143.

Polemical against Wauschkuhn. (Cf. Abstr. Bact., 1920, **4**, No. 1842.)—B. C.

SERUM THERAPY

(*See also Number 563*)

549. An Improved Method for the Production of Antimeningococcus and other Serums. J. F. Anderson. J. Infect. Dis., Chicago, 1920, **27**, 482–490.

The toxic effect upon horses of injections of meningococci can be largely avoided by the use of washed organisms. The toxic material of the cultures remains in the fluid when the organisms are sedimented by centrifuging. The points to be noted in the preparation of the antigens are: young cultures (18–24 hours); washing the bacterial emulsion; straining the emulsion to remove large clumps and particles of the medium; injection within 10 to 30 minutes after washing; slow injection. A suspension containing 5,000,000,000 bacteria per cubic centimeter was used to immunize horses, using 0.5 cc. of a polyvalent suspension of killed and washed meningococci for the first injection, increasing 0.25 cc. each day for 4 days with a resting period of 3 days, when treatment was resumed. In the second series of doses, the original dose was 0.5 cc., but was increased 0.5 cc. at each injection. In subsequent courses, the dose was increased 1 cc. at each injection. After the fourth series, living organisms were injected.

Potent, well balanced sera were produced according to the method described in this paper. The average time required to immunize a group of 18 horses to meningococci was 50 days; to pneumococci, 46 days. The loss of animals was greatly reduced.—S. B-J.

550. Bacteriologic Peptone in Relation to the Production of Diphtheria Toxin and Antitoxin. Lewis Davis. J. Bact., Balt., 1920, **5**, 477–488.

Review of the literature on the subject of toxin production by *Corynebact. diphtheriae* indicates that although the peptone content and H-ion concentration are controlled, considerable variation in toxin potency may be obtained. Bouillon with 2 per cent peptone and 0.5 per cent sodium chloride is recommended. Removal of muscle sugar with *Bact. coli* is probably unnecessary. Fat removal is important. The technic for adjusting the H-ion concentration of the broth is described. Reactions within the range pH 8.0–8.2 have been associated with maximum toxin strength. Large flasks are recommended for toxin culturing. High potency toxin and antitoxin have been obtained on a commercial scale by the methods described in this paper.—I. S. F.

551. Venom of the Philippine Cobra (Alupong) Naja Naja philippinensis. C. Monserrat, O. Schöbl and L. E. Guerrero. Philippine J. Sc., Manila, 1920, **17**, 59–64.

Determinations of the toxicity of the venom for guinea pigs, rabbits, monkeys, and frogs showed that monkeys were the most susceptible to its action, frogs the least susceptible.

The hemolytic power of the venom was found to be slightly less than that of other species.

It hemolyzed the washed red corpuscles of man, dog, rabbit, and guinea pig, but not those of sheep, goat, and cow. The hemolysins of the venom of *Naja philippinensis* are analogous to those of *Naja tripudians* as regards the activating power of blood sera of certain vertebrates, except that larger amounts of sera are necessary. The venom of *Naja philippinensis* hemolyzes equally the defibrinated and washed red cells of monkeys.

An immune serum, prepared by repeated injections of the horse with the venom, protected guinea pigs and rabbits against a lethal dose. The effect of the serum as a preventive and curative in case of snake bite in human beings has not been tried. The preparation of a dried serum for distribution to physicians is recommended.—M. W. C.

552. Zur Frage der Wirksamkeit von normalem Serum bei der Milzbrandinfektion. (The Efficiency of Normal Serum in Anthrax Infections.) Franz Gerlach. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **84**, 396–400.

The author tested the statement of Kraus and Beltrami that normal serum of cattle, horses or sheep and anti-anthrax serum are equally efficient in curing anthrax. He concludes that the statement is incorrect, and that serum showing protective power must come from immunized animals.—R. E. B.

553. Unsuccessful Result following Transfusion with Immunized Blood in a Case of Infectious Endocarditis. Louis A. Levinson. J. Lab. & Clin. M., St. Louis, 1921, **6**, 191–193.

Report of a case of infectious endocarditis treated by blood transfusions from a donor immunised against the strain of *Streptococcus viridans* isolated from the patient's blood stream. —F. W. H.

ANAPHYLAXIS

554. Die sessilen Rezeptoren bei der Anaphylaxie und die Rolle des autonomen Nervensystems beim anaphylaktischen Symptomenkomplex. (Sessile Receptors in Anaphylaxis and the Rôle of the Autonomic Nervous System in the Anaphylactic Symptom-Complex.) Walter Arnoldi and Erich Leschke. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1018–1019.

The presence of sessile cellular receptors is demonstrable through the vasodilation produced (in blood-free Trendelenburg perfusion fluid) by antigen in the sensitized frog as opposed to vasoconstriction in the non-sensitized one. Anaphylatoxin has the same vasodilatory effect *in vitro*. In anaphylactic intoxication, however, the humoral receptors, which are present in greater numbers than the sessile, play the more important rôle. The clinical picture of anaphylactic poisoning in its significant phases may be uniformly explained as due to the excitatory effect of the anaphylactic poison upon the terminals of the parasympathetic nervous system in the smooth muscles.—B. C.

VACCINE THERAPY

(*See also Numbers 463, 469, 489*)

555. Note on the Keeping Qualities of Dried and Pulverized Vaccine Virus. O. Schöbl. Philippine J. Sc., Manila, 1920, **17**, 55–57.

Dried vaccine was prepared by spreading the ground pulp over a large surface under aseptic conditions and drying rapidly over a hygroscopic chemical *in vacuo*. This preparation was kept in a desiccator at room temperature, and tested for its potency upon monkeys at weekly intervals. The "takes" were entirely satisfactory during a period of 4 months following drying. Longer periods have not yet been tried.

In the experiments upon vaccine prepared in this way, drying was found to decrease the bacterial content 360 times.—M. W. C.

556. Blood Changes and Antibody Production in Human Beings after Injection of Pneumococcus Lipovaccine. K. M. Howell. J. Infect. Dis., Chicago, 1920, **27**, 557–564.

After a single subcutaneous injection of 0.83 mgm. of dried pneumococcal protein from Types I, II, III pneumococci, made up as a lipovaccine, the blood counts of 3 men showed a slight increase of polymorphonuclear leucocytes and eosinophiles.

After 11 to 12 days, there was a definite rise in the agglutinin titer. The height of agglutinin titer was reached on the 15th, 25th, 31st days, respectively, for each case. The highest titers for agglutinins for all three types of pneumococci were in case 1, for Type I, 1:10,000; Type II, 1:1,280; Type III, 1:25,000; in case 2, 1:280 for each organism; in case 3, for Type I, 1:32,768; Type II, 1:128,000; Type III, 1:64,000. Complement fixation reactions for the pneumococci were positive with the serum of each case, and these sera protected mice against experimental infection with pneumococci. Agglutinins in low titer were demonstrable in the serums of these men nearly a year after the vaccination.—S. B-J.

557. Untersuchungen über die Schutzwirkung des Behringschen Diphtherieschutzmittels T. A. in der Praxis. (The Protective Power of the Behring Toxin-Antitoxin Protective Substance against Diphtheria in Practice.) Walter Bieber. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1184–1187.

In 6 communities with a total population of about 14,500 (from 1913–1919), there were 633 children completely immunized against diphtheria with toxin-antitoxin injections, 255 "doubtfully" immunized and 209 unsatisfactorily injected. There were also 3275 non-immunized children. During that period 15 per cent of the non-immunized had diphtheria and 4.3 per cent of the immunized (only 3.3 per cent of those fully immunized). The record was even better in places visited by epidemics.—B. C.

558. The Practical Application of Vaccine Prophylaxis and Treatment. E. Cronin Lowe. Practitioner, Lond., 1920, **105**, 248–265.

This paper deals largely with the use of so-called autogenous stock vaccines. Good results are claimed for vaccines used in respiratory infections, the vaccine being prepared from organisms present in a locality or community.

These observations were made chiefly upon troops brought to England from the Colonies; the paper also discusses vaccine therapy as related to civil life and a wide variety of infections. —C. P. B.

559. The Diagnosis, Therapeutics and Prophylaxis of Chicken-pox of Fowls. J. R. Beach. J. Am. Vet. M. Ass., Wash., 1921, **58**, 301–312.

The author does not find anything to indicate any relationship between chicken-pox and roup. The use of chicken-pox vaccine has been found to be a valuable aid in the treatment of both chicken-pox and canker. The vaccine is used for prevention rather than cure. The length of immunity appears to be from 2 months to more than 2 years. The preparation of the vaccine is described, also the attempts to standardize it. A malnutritional disease resembling roup is described.—W. A. B.

NON-SPECIFIC THERAPY

560. Zur Grippeerkennung und Grippebehandlung. (The Recognition and Treatment of Influenza.) H. Much, H. Schmidt and F. Peemöller. München. med. Wchnschr., 1920, **67**, 1057–1059.

Non-specific immunity is the factor that should be strengthened in acute infectious diseases. Much has prepared a vaccine consisting of: (1) immunologically reactive proteins derived from various non-pathogenic bacteria; (2) a reactive lipoid mixture from bile; and (3) a reactive fat mixture. This is recommended for all conditions where there are indications that the non-specific immunity of the body is low.

This mixture, or its components, was used clinically in 91 severe cases (54 complicated with pneumonia), and the resulting case fatality rate was 13 per cent. This result is considered encouraging. A cutaneous test with killed Friedländer's bacilli and other material was used as an indicator of the presence or absence of non-specific immunity.—B. C.

561. Ueber septikämische Prozesse und ihre Beeinflussung durch leistungssteigernde Massnahmen. (Septicemic Processes and their Influencing by Means of Activating Procedures.) Wolfgang Weichardt. München. med. Wchnschr., 1920, **67**, 1085–1087.

Procedures for cell activation, like non-specific protein therapy, may be helpful even in septicemic conditions. They must, however, be applied during the infectious process at a time when the defenses of the body are still potent.—B. C.

EXPERIMENTAL INFECTION

562. Lack of Correlation among Meningococci, between Serological Grouping and Lethal Effects on Rabbits. Alice C. Evans. J. Med. Research, Bost., 1920, **42**, 33–48.

Rabbits were treated with repeated intravenous inoculations of living meningococci, and afterward were given a massive dose sufficient to kill an untreated rabbit. Judged by the time and manner of death, and by lack of evidence of multiplication of meningococci within the body, it would appear that death of rabbits saturated with meningococci was caused by disintegration of the organisms without multiplication or the elaboration of an exotoxin. Rabbits were protected against these poisons by previous injections of living meningococci without regard to agglutinin or tropin grouping.

A strain of meningococcus, which had lost its power to produce tropins by long cultivation on agar, partially retained its power of immunizing rabbits against fatal doses of meningococci. These rabbits were shown to be protected without the presence of tropins in the serum.—A. C. E.

563. Rôle des hemolysines dans l'intoxication microbienne. (Rôle of the Hemolysins in Bacterial Intoxication.) Weinberg and Nasta. Ann. de l'Inst. Pasteur, Par., 1920, **34**, 690–700.

In order to determine the part played by hemolytic substances produced by bacteria in the general intoxication of an animal in the course of an infection, the authors made a comparative study of the total toxins of certain bacteria and of the same toxin from which the hemolytic substances had been removed. The toxins studied were those of *B. perfringens, Vibrion septique, Staphylococcus aureus*, and *Streptococcus hemolyticus*. The toxins were prepared by centrifuging broth cultures, filtration being avoided because a large amount of hemolysin is removed by Chamberland filters. The effects of the toxins were observed after intravenous injections into guinea pigs. Two processes were used to remove the hemolysins from these toxins: (1) saturation of the toxin with erythrocytes, and (2) neutralization of the hemolysin with normal horse serum. Explanatory details of the units used to measure hemolysin and the antihemolytic index are given.

In the action of the toxin of *B. perfringens* the hemolytic substances play a most important rôle. The toxic properties of the culture of this organism are greatly weakened when hemolysin is removed or neutralized.

With the toxin of *Vibrion septique*, the hemolysin was less important or was overshadowed by the powerful action of the non-hemolytic fraction of the toxin.

Although the hemolysin produced by *Staph. aureus* does not play a predominant rôle in the intoxication with broth cultures of this microorganism, it contributes a large part to the general intoxication.

Normal horse serum was found to possess a considerable antihemolytic action, neutralizing the hemolysins in these bacterial toxins. This property may be the cause of the success reported in the use of normal horse serum in the treatment of certain infections, notably infection due to the streptococcus.—S. B-J.

564. Contribution à l'étude des microbes antagonistes de la bactéridie charbonneuse. (Bacillus anthracis.) Recherches expérimentales. (Contribution to the Study of Bacteria Anatgonistic to the Anthrax Bacillus. Experimental Researches.) W. Silberschmidt and E. Schoch. Ann. de l'Inst. Pasteur, Par., 1920, **34**, 669–683.

Friedländer's bacillus injected simultaneously with *B. anthracis* exerts an antagonistic action on the anthrax bacillus, often allowing the guinea pig or rabbit to survive an otherwise fatal infection. In like manner, simultaneous subcutaneous inoculations of mixtures of anthrax and typhoid bacilli, or of anthrax and colon bacilli into rabbits, guinea pigs and mice, protect these animals against anthrax. When the two cultures of anthrax and another organism are inoculated at the same point, this antagonism is most marked. The antagonistic action is not always demonstrable when the second culture is injected at another point. When the second culture is injected 8 hours after the injection of *B. anthracis*, the animals die of anthrax. Killed cultures of these microorganisms have no antagonistic action on the anthrax bacillus. The animals which survive the injection of mixed cultures of the anthrax bacillus and other bacteria are not immunized thereby to anthrax.

There is no relation between inhibition of the anthrax bacillus by other bacteria *in vitro* and this antagonism *in vivo*. The author thinks that the study of the phenomena described in these experiments will elucidate many problems of immunity and susceptibility.—S. B-J.

565. The Fate of Killed Non-hemolytic Streptococci Injected into the Blood, and the Resulting Cellular Changes. K. Nagao. J. Infect. Dis., Chicago, 1920, **27**, 327–362.

The outstanding features of the cellular reaction after the intravenous injection of non-hemolytic streptococci are the accumulation of phagocytic polymorphonuclears in the capillaries of the lung, the liver and spleen; the great leucocytogenic activity of the marrow; and the phagocytic activity of the endothelial cells of the liver and spleen and of the polymorphonuclears in the blood.

Evidence is presented to show that in local inflammation plasma cells may develop from existing perithelial lymphoid cells, as well as from immigrated lymphocytes.

The phases of changes in the number and types of leucocytes were studied in detail. A leucopenia following the intravenous injection of killed streptococci was associated with the accumulation of leucocytes in the capillaries of the lungs. Subsequent liberation of characteristic substances from the cocci and injured leucocytes led to leucocytosis. Disarrangement of the normal Arneth's scale began soon after the injection and reached its height in 3 hours, classes 1 and 2 constituting 78–88 per cent of the polymorphonuclear cells. The blood picture harmonized with the microscopic appearance of the bone marrow and was thought to be the result of an exhaustion of the reserve cells in the bone marrow followed by repeated rapid cell division.

The paper contains a review of the literature and a detailed description of the cytological studies made by the author.—S. B-J.

566. The Effect of Streptococcus Hemolyticus Infection on the Reaction of the Blood of Rabbits. L. R. Dragstedt. J. Infect. Dis., Chicago, 1920, **27**, 452–459.

Experimental infections with *Streptococcus hemolyticus* in rabbits produced a relatively marked acidosis, the pH of the blood varying from 7.65, which is normal, to 7.3 in an extreme case. The animals lost weight after inoculation, but the loss of weight was not marked during the 3 or 4 days of the experiment.

It was thought that as the final pH of this streptococcus in culture was 4.63 the acidity of the blood did not play any effectual rôle in the mechanism of resistance.—S. B-J.

567. Inhalation Experiments on Influenza and Pneumonia, and on the Importance of Spray-borne Bacteria in Respiratory Infections. W. B. Wherry and C. T. Butterfield. J. Infect. Dis., Chicago, 1920, **27**, 315–326.

When white mice, white rats and guinea pigs were exposed to finely divided influenza sputum sprays some died of a primary pneumonia, others of a general infection due to *B. enteritidis*. As primary pneumonia could not be produced in mice when the strain of *B. enteritidis* was inoculated through the buccal or gastro-intestinal mucosa, the conjunctiva, subcutis or peritoneal cavity, but only when sprayed, the authors think that something in the sputum from patients with influenza produced a change in the pulmonary tissues favoring such secondary localization. This hypothetical substance or virus was not isolated.

Inhaled bacteria were found to reach the deepest alveoli or capillary bronchi of the lungs of mice.—S. B-J.

568. The Effect of Roentgen Ray and Thorium X on Pneumococcus and Streptococcus Infections in Mice. H. J. Corper and P. Chovey. J. Infect. Dis., Chicago, 1920, **27**, 491–498.

Mice subjected to a single non-lethal exposure to the roentgen ray capable of producing leucopenia, or mice given a single non-fatal injection of thorium x, also causing leucopenia, and shortly thereafter inoculated with pneumococci and hemolytic streptococci revealed an increased susceptibility to these organisms. The treated animals were killed by inoculations which normal animals survived. The cocci appeared earlier and persisted longer in the blood of the treated than in the blood of the normal animals.—S. B-J.

569. Experimentelle Untersuchungen über Milzbrandinfektion bie Ratten. (Experimental Studies on Anthrax Infection in the Rat.) F. Fukuda. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt. Orig., 1920, **84**, 516–521.

The author has found it possible after a few animal passages so to increase the virulence of a culture of anthrax bacilli for white rats that the subcutaneous injection of from one-third to one loop of material readily led to the death of the animal in from 27 to 54 hours. The injection of calcium chlorid in amounts of one-thousandth to three-hundredths of a gram, at the same time as the anthrax bacilli, usually resulted in a lengthening of the course of the disease. Infection with the trypanosome of Nagana likewise tended to lengthen the course of the disease in rats. The antagonistic action of *Bacterium pyocyanum* towards anthrax as described by Emmerich and Leow was likewise noted.—R. E. B.

CHEMOTHERAPY

(See also Numbers 378, 518, 527)

570. Quantitative Studies in Chemotherapy. IV. The Relative Therapeutic Value of Arsphenamine and Neoarsphenamine of Different Manufacture. Carl Voegtlin and Homer W. Smith. J. Pharmacol. & Exper. Therap., Balt., 1921, **16**, 449–461.

Voegtlin and Smith found 6 different brands of arsphenamine, one of German manufacture, to have about the same trypanocidal activity but 6 specimens of neoarsphenamine to show slightly greater variations, the maximum difference being 80 per cent. The authors were unable to find any relation between the toxicity and the trypanocidal action of these drugs. They suggest the alleged greater effectiveness of arsphenamine in the treatment of human lues may be due to the precipitation of this preparation at the hydroxyl ion concentration of the blood so that its oxidation and elimination are considerably diminished. They feel that a choice between these drugs should be determined by the clinical results and by the practical advantages and disadvantages in their use. A study of the trypanocidal action of some aliphatic arsenicals confirmed the principle, derived from a former investigation of the aromatic arsenicals, that the only forms of arsenic exerting a direct toxic action on protoplasm are the trivalent oxides. Cacodylic acid even in lethal doses is not trypanocidal, while methyl and ethyl arsenic acid are parasitocidal only in doses approximating the lethal dose.—F. W. H.

571. Zur Dosierung des Salvarsans. (*The Administration of Salvarsan.*) WALTHER WEIGELDT. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1193.

Salvarsan therapy for syphilis beyond the second stage should be based on the following rules: Salvarsan in syphilis is indicated only when clinical symptoms are present. A positive Wassermann reaction alone is as a rule no indication. The lower limit of a therapeutic dose is 6.0 grams neosalvarsan within 60 days. No salvarsan is better than too little. Salvarsan therapy is without result in tabes and general paralysis.—B. C.

572. Ueber Sublimatsalvarsaninjektionen (Linser) bei Lues. (*Linser's Sublimate-Salvarsan Injections in Syphilis.*) HOLZHÄUSER. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1222–1223.

Linser's sublimate-salvarsan is a combination of both substances which yields satisfactory results in the treatment of syphilis. It is claimed to be equal in effectiveness to silver-salvarsan and to sublimate and salvarsan given together.—B. C.

573. Ueber intermittierende Therapie, III. Zur Wirkung der Narkotika, zugleich ein Beitrag zur unspezifischen Therapie der Infektionskrankheiten. (*Intermittent Therapy. III. The Effect of Narcotics and Non-specific Therapy in Infectious Diseases.*) H. KÖNIGER. München. med. Wchnschr., 1920, **67**, 1136–1139.

Narcotics and antipyretics frequently exert secondary, deeper effects on disease processes. There is a characteristic dependence of these secondary effects upon the extent of the intervals between administrations. Experiments with codein in tuberculous fevers show that cessation of dosage after continuous daily administration was followed frequently by a disappearance of the fever and temporary improvement. This effect is explained as being due to non-specific increase in resistance caused by the narcotics.—B. C.

BOOK REVIEWS

574. Sanitary Entomology. The Entomology of Disease, Hygiene and Sanitation. Edited by W. D. PIERCE. The Gorham Press, Boston. 1920.

This volume represents an expansion and revision of a series of lectures on sanitary entomology given during the war by a group of ten experts. Most of the authors were connected with the U. S. Department of Agriculture in Washington, and could present an authoritative and down-to-date statement of their special topics.

To even list the subjects of the thirty-five chapters, any one of which is replete with valuable material, would be impossible here. A few, only, of the special features can be pointed out.

Dr. B. H. Ransom has contributed a very valuable section on the "Relation of Insects to Parasitic Worms." He points out the mode of infection of the invertebrate and the vertebrate host and then gives an annotated list of the important species found in insects. This is followed by a compendium of parasites arranged according to arthropod hosts, of which there are listed 111 species.

Dr. Pierce presents an extensive list of diseases borne by non-biting flies. Important phases in the life history of the non-biting flies, and methods of control of the house-fly and related species are considered in detail. A valuable feature of this section is C. F. Greene's chapter on "Common Flies and How to Tell Them Apart."

F. C. Bishopp's consideration of the control of flies in barnyards, pigpens and chicken yards and E. W. Laake's chapter on insects in relation to packing houses embody much new and important material. This is also true of Bishopp's excellent discussion of the general topic of myiasis, or the attack of living man or animals by fly larvae.

The effect of the war-time investigations is well shown in the consideration of the louse problem. This section not only includes a good survey but embodies many of the results of the original work of its writers, Dr. Pierce and Dr. R. H. Hutchison.

At the close of the volume is a twenty-five page tabulation of diseases and insect transmission. There will be objections that this, as well as some of the lists elsewhere in the text, is too inclusive. The editor himself says "There is always a danger that people will accept a tabulation as authoritative. It is not, in this case at least, a critical compilation."

The book is a notable contribution to the literature of medical entomology. It will prove an invaluable reference book for sanitarians and entomologists, and will do much to stimulate interest in its field.—W. A. R.

575. *Die Kriebelmückenplage. Übersicht über die Simuliidenkunde, besonders in praktischer Hinsicht.* (*The Simulium or Blackfly Plague.*) J. Wilhelmi. Jena. Gustav Fischer, 1920, 246 pp. and 23 text figs.

The Simulium flies, often called "black flies" or "buffalo gnats" in this country, are the most troublesome of insect pests in the regions in which they abound. They have occurred in notable outbreaks in this country, causing great loss of cattle, horses and mules in the Mississippi Valley. These outbreaks attracted much attention but neither in this country nor elsewhere have they been intensively studied until recently.

In 1914 the gnats appeared in alarming numbers in the region of the Aller and the Lein Rivers in Germany and were the cause of heavy losses of stock. Fortunately for the elucidation of some of the problems involved this comparatively limited area was within reach of a number of government, school and university laboratories and the opportunity to unite these various agencies in a comprehensive study was seized upon.

As a first step towards this study Dr. J. Wilhelmi of the "Landesanstalt für Wasserhygiene" in Berlin undertook a detailed study of the status of our knowledge of the problem. The book before us presents the result of this review, together with a plan of organization of the project for further study.

Chapters are devoted to nomenclature, including the popular names used in various sections and in other countries; to the morphology and anatomy of the adults; the geographic distribution and the ecology and biology of the adults.

The effect of the attacks of the adults on both man and animals is considered at length. Under this heading are discussed the pathology and therapy of the animals attacked, and also the question as to the transmission of disease by the gnats.

The general features of embryonic development are treated in connection with a fuller discussion of the larval and pupal stages. This is followed by a valuable consideration of the ecology and biology of the larvae and pupae.

The remainder of the text is largely devoted to a review of the various methods of protection which have been recommended and to an outline of the proposed campaign against the pest. A bibliography of over 400 titles chronologically arranged, is added. Unfortunately, several of the most important American papers seem to have been available only in abstract.—W. A. R.

MISCELLANEOUS

576. *L'Immunité naturelle et acquise chez la chenille de Galleria mellonella.* (*Natural and Acquired Immunity of the Larvae of Galleria mellonella.*) S. Metalnikow. Ann. de l'Inst. Pasteur, Par., 1920, **34**, 888–909.

During the past 10 years the author has had under observation thousands of larvae of *Galleria mellonella.* He has never seen an epidemic of any infection among them.

To study their immunity, he devised methods of collecting "blood" from the larvae, and was able to inject into their body cavities a great variety of microorganisms. The reactions to these injections were studied in sections of the larvae. After injection, the larvae were kept in an incubator at 37°C. It was found that the larvae had an extraordinary resistance to bacteria. Most of the ordinary microorganisms pathogenic for man were unable to infect or kill larvae. The bacteria pathogenic for the larvae were: *B. coli communis*, *B. subtilis*, *B. anthracoides*, and *Proteus* N. 19.

Interesting data are given as to the fate of tubercle bacilli injected into the larvae. The bacilli are almost immediately surrounded by phagocytes, which soon fuse together forming a giant cell. The periphery then becomes enveloped in a capsule of epithelioid cells, and the bacilli in the center degenerate into dead granules.

The blood of the larvae does not contain any bactericidal or antitoxic properties. The immunity of the larvae is due entirely to the vigorous and prompt action of its phagocytes.—S. B-J.

577. *The Fate of India Ink Injected into the Blood. I. General Observations.* K. Nagao. J. Infect. Dis., Chicago, 1920, **27**, 527–538.

The route of transportation, places of deposition and manner of ultimate removal of fine particles of India ink injected into the veins and cavities of the body were studied by Nagao to gain light on the distribution and fate of bacteria which invade the blood.

Free granules of ink are present in the blood for several hours after their injection. Ink granules are deposited in the endothelial cells of the liver, spleen and marrow and in the splenocytes. In the liver, the granules are deposited in the endothelial cells of the blood capillaries, the greatest number of granules in the cells near the central vein, the least in the capillaries at the periphery of the acini. In the spleen the granules are accumulated irregularly in the periphery of the Malpighian bodies. After large injections osteoclasts and osteoblasts may take up granules. Some days after the injection granules appear regularly in the cardiac, hepato-duodenal and jugular lymph nodes, which become quite black. After large injections granules appear in the liver cells and endocardial cells.

Nucleated red cells appear in the blood after the injection of ink. The polymorphonuclear and mononuclear cells in the blood take up the granules. Eosinophile and mast cells, however, do not do this. Abnormal cells, possibly of endothelial origin occur in the blood after the injection of ink.

The ink granules are not discharged from the body by any particular organ after injection into the blood, but some of them are carried to the outside by emigrating phagocytes. The distribution of the granules in the lung is not described in this paper.—S. B-J.

578. *Untersuchungen über den Cholesteringehalt von menschlichen Gallen.* (*Investigations upon the Cholesterin Content of Human Bile.*) M. NATHAN. Virchow's Arch. f. Path. Anat. (etc.), Berl., 1920, **228**, 51–67.
An analysis of a number of cases with a review of the literature.—S. A. G.

579. *Hypophyse und Diabetes Mellitus.* (*Hypophysis and Diabetes Mellitus.*) E. F. KRAUS. Virchow's Arch. f. Path. Anat. (etc.), Berl., 1920, **228**, 68–133.
In 23 cases of diabetes mellitus in individuals from 14 to 77 years there were found in the younger individuals and 2 cases in the older ones, characteristic changes in the hypophysis, such as atrophy with a decrease in the number and size of eosinophilic cells as well as abnormal shapes and arrangement of these cells with pyknotic nuclei.—S. A. G.

580. *Zur Frage der postmortalen Autolyse der Zellgranula.* (*The Postmortem Autolysis of Cell Granules.*) OKA. Virchow's Arch. f. Path. Anat. (etc.), Berl., 1920, **228**, 200–215.
This is an attempt to determine the relative amount of autolysis in different tissues of rabbits under various conditions.—S. A. G.

581. *Ueber die selektionistische Auffassung des Infektionsprozesses.* (*The Infection Process Conceived as a Phenomenon of Natural Selection.*) L. R. GROTE. München. med. Wchnschr., 1920, **67**, 1083–1085.
From a viewpoint of natural selection, an infectious disease may be assumed to be a conflict or maladjustment in the tendency toward symbiosis between host and parasite. The collision is between the vital demands of the two organisms. The disease itself represents the expression of incomplete adaptation of one to the other.—B. C.

582. *Beitrag zum Wesen und der Behandlung der Epikondylitis.* (*The Occurrence and Treatment of Epicondylitis.*) WILHELM V. GOELDEL. München. med. Wchnschr., 1920, **67**, 1147–1148.
Of the 22 cases reported upon, 6 were due to direct, and 3 to indirect trauma. The rest comprise a group in whom metabolic disturbance is probably at the bottom of the ailment. Only 5 of the cases occurred in men, the rest being among women. The three main symptoms circumscribed, localized pain, fatigue of the extremity, and disturbance of function. Alcoholic injections are to a certain extent effective in treatment.—B. C.

583. *Beitrag zu den biologischen Wirkungen der akzessorischen Nährstoffe.* (*The Biological Effects of the Accessory Food Substances.*) E. FREUDENBERG AND P. GYÖRGY. München. med. Wchnschr., 1920, **67**, 1061–1062.
Surviving liver cells and cells from the jejunal mucosa were found to have their oxygen demand increased in the presence of vitamine-rich extracts. If this oxidation accelerating effect is a constant property of the accessory foodstuffs the phenomenon might be highly useful in determining their presence and extent.—B. C.

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VOLUME V NUM

ABSTRACTS
OF
BACTERIOLOGY

UNDER THE EDITORIAL DIRECTION OF THE
SOCIETY OF AMERICAN BACTERIOLOGISTS

APRIL, 1921

EDITOR
A. PARKER HITCHENS

It is characteristic of Science and Progress that they continually open new fields to our vision.—PASTEUR

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ABSTRACTS OF BACTERIOLOGICAL LITERATURE

HISTORY, BIOGRAPHY, LITERATURE

584. L'Ecole expérimentale et bactériologique lyonnaise. (The Lyon Experimental and Bacteriological School.) Fernand Arloing. Rec. méd. vét., Par., 1920, **96**, 468–487.
An interesting account of the development of experimental medicine at Lyon. Reference is made to the men and their work with the infectious diseases of animals from 1850 down to recent times.—W. G

585. Value of Animal Experimentation to Mankind. Geo. H. Whipple. Am. J. Pub. Health, Chicago, 1921, **11**, 105–107.
It is only by a clear understanding of the disease virus and its transmission that the disease can be prevented. The progress of medicine in the past has depended upon animal experimentation and upon it future progress will be equally dependent.—M. C. P.

CHARACTERIZATION AND CLASSIFICATION

(See also Number 752)

586. Some Atypical Colon-Aerogenes Forms Isolated from Natural Waters. Margaret C. Perry and W. F. Monfort. J. Bact., Balt., 1921, **6**, 53–68.
In the course of study of 392 cultures isolated from natural waters on the basis of gas-formation in lactose broth, more or less characteristic colonies on Endo's medium, and usually gas in lactose broth after transfer from Endo's medium some 35 strains were specially studied and are arranged to demonstrate the absence of the theoretical relation of the Voges-Proskauer and the methyl red reactions. There is distinct evidence for lack of agreement in the discrimination of high and low gas-ratio types. Results with Koser's uric acid test indicate its special usefulness in correlating with other characters of the aerogenes type. Five spore-forming organisms were isolated which, from their other characteristics and reactions, are considered nevertheless to belong to the colon-aerogenes group. This apparently anomalous conclusion is considered to be concordant with accepted views in light of the work of Löhnis and Smith and Itano and Neill. The paper contains detailed descriptions of the metabolic reactions of the organisms which have been studied.—I. S. F.

587. A Classification of Diphtheria Bacilli Based on the Toluidine Blue-iodine Method of Staining. Henry Albert. Am. J. Pub. Health, Chicago, 1920, **10**, 936–939.
The author discusses a special staining process which develops granules, or bars, not visible with other stains. This new morphology is claimed to give a basis for determining non-virulent forms. A new morphological classification is given.—M. C. P.

NEW SPECIES

588. A Mutating, Mucoid Paratyphoidbacillus Isolated from the Urine of a Carrier. Th. Thjøtta and Odd Kinck Eide. J. Bact., Balt., 1920, **5**, 501–510.
While following a case of paratyphoid pyelitis with numerous bacilli in the urine, the authors observed a sudden reduction in true paratyphoid bacilli and a simultaneous appearance of colonies of a new organism. These colonies were quite typical, large, round and wet or slimy in appearance. Its fermentative reactions are identical with those of the typical paratyphoid bacilli. The new bacilli were small mucus formers, lacking in motility. The agglutination reaction was specific but a little slower than that of the typical paratyphoid bacilli. The absorption of complement, the resistance against normal bactericidal serum and virulence for white mice were all identical with those of the typical paratyphoid. The new form keeps its characters after even prolonged artificial cultivation. It is considered a true mutant.—I. S. F.

BACTERIAL NUTRITION AND METABOLISM

589. The Gas Production of Streptococcus kefir. James M. Sherman. J. Bact., Balt., 1921, **6**, 127–131.
The CO_2 produced by organisms of the *Streptococcus kefir* type, when grown in ordinary lactose broths, is derived from the carbohydrate portion of the media. The CO_2 production is apparently limited by the acid which is produced in the course of the fermentation. When the sugar broth is highly buffered the CO_2 production is increased. Experiments with various

sugar-free broths of various compositions indicate that the gas production is not associated with the nitrogenous materials. Experiments with organic acids indicated that these probably were not the source of the CO_2. The observation of Evans (J. Agric. Research, 1918, **13**, 235) that more CO_2 is produced by these organisms in trypsin-digested milk than in lactose broth is presumably explained by the higher buffer content of the digested milk.—I. S. F.

590. The Viability and Growth of B. typhosus in Bile. T. D. BECKWITH AND R. H. LYON. J. Infect. Dis., Chicago, 1921, **28**, 62–66.

The effect of bile upon the viability and growth of a typical strain of *B. typhosus* was studied by inoculating various types of bile with this organism and by making bacterial counts at certain intervals. The specific bile salts were not studied separately. The bile used was sterilized in the autoclave at 15 pounds for 15 minutes. Its reaction was usually pH 8.4 after sterilization. A control series of cultures in nutrient broth, without bile was used as a comparison.

The counts showed definitely that *B. typhosus* in bile first passes through a period during which the bile kills from 40 to 74 per cent of the organisms. After undergoing this germicidal action, which lasts about 1 hour, the bacilli pass through a period of growth-lag, lasting about 2 hours. After the period of lag, there is a slow progressive, but ultimately feeble growth of *B. typhosus* in bile.—S. B-J.

591. Value of Brilliant-Green in Eliminating Errors Due to Anaerobes in the Presumptive Test for B. coli. THEODORE C. MUER AND ROBERT L. HARRIS. Am. J. Pub. Health, Chicago, 1920, **10**, 874–875.

Brilliant-green, in lactose bile, inhibits the growth of anaerobes; and where 10 per cent gas is formed seems to be "positive" rather than a "presumptive" test for *B. coli*. A dilution of 1:30,000 was sufficient to eliminate *B. welchii; B. coli* required a dilution of 1:100 for a similar effect.

The authors claim these results are not obtainable unless bile is used.—M. C. P.

PHYSICAL CHEMISTRY

592. The Influence of Various Chemical and Physical Agencies upon Bacillus botulinus and Its Spores. I. Resistance to Salt. ZAE NORTHRUP WYANT AND RUTH NORMINGTON. J. Bact., Balt., 1920, **5**, 553–557.

A study of 19 strains of *B. botulinus* in alkalin media (reaction −0.5) with NaCl in concentrations of 1 to 10 per cent indicated considerable variations in the viability of the organisms after various periods of time. Five strains of low, 5 of high virulence, and 4 others were still viable after 27–49 days in 10 per cent NaCl; 3 virulent strains survived 11 days but not 31 or 49 days in 10 per cent NaCl solutions. Inhibition of *B. botulinus* in salt solutions up to 10 per cent which has been described by other authors is probably not concerned with the NaCl so much as with the acidity of the culture media.—I. S. F.

BACTERIOLOGICAL TECHNIC

(See also Number 602)

593. Method for the Intravenous Injection of Guinea Pigs. GEORGE B. ROTH. J. Bact., Balt., 1921, **6**, 249–252.

The author describes and pictures an animal board for use in the intravenous injection of guinea pigs, and recommends the use of the large superficial vein lying on the dorsal and inner aspect of the hind leg of the animal. The technique of the operation is described.—I. S. F.

594. The Use of Washed Agar in Culture Media. S. HENRY AYERS, COURTLAND S. MUDGE AND PHILIP RUPP. J. Bact., Balt., 1920, **5**, 589–596.

The use of ordinary laboratory agar in the preparation of milk-powder agar is hampered by the formation of a precipitate during sterilization. Qualitative tests indicated that this precipitate is formed by the calcium and magnesium salts in the agar combining with the milk-powder phosphates. Preliminary washing of the agar in distilled water avoided the formation of this objectionable precipitate, because the calcium and magnesium contents were reduced. Standard extract medium prepared with washed agar gave higher bacterial counts for market milk than the same medium with regular, unwashed, shred agar. The higher counts are probably associated with the lowered Mg and Ca contents of the media. A further study of the value of washed agar in bacteriological work is suggested.—I. S. F.

595. Rose Bengal as a General Bacterial Stain. H. J. CONN. J. Bact., Balt., 1921, **6**, 253–254.

The dye, rose bengal, has been found to be particularly well suited for the staining of such organisms as *B. radicicola* and *Ps. caudatus* which produce slime. The stain has a great affinity for bacterial protoplasm but not for the slime or debris with which the cells are surrounded. In addition, the stain seems to be well adapted to revealing the structure of small bacterial cells, and hence is recommended as very valuable for general laboratory use. A satisfactory formula is: Rose bengal, 1 gram; 5 per cent phenol, 100 cc. This solution remains in good condition for several months.—I. S. F.

596. *A Contribution to the Staining of Phagocytes and Exudates.* HOWARD B. CROSS. Johns Hopkins Hosp. Bull., Balt., 1921, **32**, 51–52.

The author describes a stain for the study of phagocytosis and exudates and gives the technic for its use. Its preparation and application are so simple and rapid and the results are so uniformly successful that it seems a more satisfactory stain than those commonly. used for this purpose.—F. W. H.

FERMENTATION INDUSTRIES

597. *Über Weinhefe und deren Kupfergehalt.* (*Concerning Wine Yeasts and Their Copper Content.*) F. WIRTHLE AND KARL AMBERGER. Ztschr. f. Untersuch. d. Nährungs- u. Genüssmittel, Berl., 1920, **12**, 365–366.

The authors found copper in yeast from young wine fermentation in following amounts: on wet basis, 0.01 per cent; on dry basis, 0.0205 per cent. This agrees with a previous analysis made by the same investigators. Reference is made to the technique used in obtaining ether extract.—E. LE.

PLANT PATHOLOGY

598. *Influence of Temperature and Humidity on the Growth of Pseudomonas citri and its Host Plants and on Infection and Development of the Disease.* GEO. L. PELTIER. J. Agric. Research, Wash., 1920, **20**, 447–506.

The principal points discussed by the author are: temperature and humidity relations of *Ps. citri*; the temperature and humidity relation of the host plants of *Ps. citri*; and the influence of the temperature and humidity upon infection and development of the disease.

The minimum, optimum, maximum, and thermal death point temperatures for *Ps. citri* were found to be respectively, about 5°, between 20° and 30°, about 35°, and between 49° and 52°C.

Three conditions are essential to infection—the presence of free moisture on the plant, a suitable temperature, and actively growing plants. No canker could be produced on dormant plants. The minimum temperature for successful infection appears to be near 20°C. with the optimum between 20° and 30°C. The minimum, optimum, and maximum temperatures for infection and development of the disease varies somewhat depending upon the influence of temperature upon the host plant. Infection may take place at a temperature or under conditions which will not permit the disease to develop, in such case the organisms may lie dormant until conditions favorable to development are brought about. The period of incubation and progress and extent of the development of the disease are influenced by the temperature. At 20°C. only new growth was attacked, at 25° new twigs and a few leaves were diseased, while at 30°C. all parts of growing plants were readily attacked.

The organism was found to be very susceptible to a combination of high temperature and humidity. Medium humidities at all temperatures are not injurious, with all humidities at low temperatures the organisms are not killed. "In general the conditions which bring about the most active growth of the host plants are also responsible for the most rapid development of the disease."—P. L. G.

DAIRY BACTERIOLOGY

(*See also Numbers 589, 599, 731*)

599. *Experiments in Farming.* H. L. RUSSELL AND F. B. MORRISON. Ann. Rpt. Director Wisconsin Agr. Exp. Sta. (Madison), 1918–1919, Bull. 319, 76 pp. 1920.

A brief record is given in this annual report of experiments in progress in the field of dairy bacteriology. These include mention of work done by E. G. Hastings in comparing the methylene blue reductase test with the number of bacteria as determined by direct microscopic examination. Reports of this work have already been published (see Abstrs. Bact., 1920, **4**, Nos. 1579 and 2007).

Work is also in progress by E. G. Hastings and J. L. Sammis on the development of flavors in cheese made from pasteurized milk by the use of starters. To overcome the lack of flavor where lactic acid starters were used, these were combined with starters prepared from digested milk inoculated with soil or with feces. Material from these sources was chosen as all milk contains organisms derived originally from these substances. The cheeses prepared with supplementary starters showed a marked difference in the extent of flavor development over control cheeses made with lactic acid starters only.

Studies are also in progress at this Station by H. H. Sommer on the relation between the acidity of milk and the coagulation of milk in condensed milk. These studies have shown that the amount of acidity in fresh milk that is capable of being determined by the chemical process of titration has nothing to do with coagulation. The coagulation point appears to be determined largely by the balance between the lime and the citrates and phosphates in milk.—R. S. B.

600. *Standard Methods for the Sanitary Analysis of Milk.* Adopted by Laboratory Section. Am. Public Health Ass., Bost., 1921, 24 pp.

The third edition of the Standard Methods of Milk Analysis which was adopted at the San Francisco meeting of the A. P. H. A. was drawn up by a committee consisting of W. H. Park, Chairman, M. P. Ravenel, R. S. Breed, John F. Anderson, and H. A. Harding with B. H. Stone and Wm. R. Stokes as adjunct members. A summary of the more important changes from the second edition is given in the preface as follows:

"1. The scope of the report has been broadened to cover the sediment test and the examination of milk for the presence of long chain streptococci.

"2. A summary of required procedures is given at the end of the report.

"3. Encouragement is given for further investigation of promising new laboratory methods.

"4. Official recognition is given to microscopic counts made directly from unpasteurized milk.

"5. Methods for determining the H-ion concentration of agar media are given.

"6. It is recommended that the practice of speaking of agar plate counts as showing the number of "bacteria" per cc. be discontinued and that a more accurate form be used.

"7. It is insisted that punitive actions should be based upon the average results from a series of samples, and that routine counts should be verified by suitable procedures when actions based on their use are likely to be questioned."

The various methods described in the report are taken up under the headings: a. Macroscopic colony count (Petri plate method). b. Microscopic count of bacteria (Breed method). c. Microscopic colony count (Frost method). d. Verification and research methods. e. Sediment test. f. Detection of specific pathogens in milk.—R. S. B.

601. *Pasteurization of Milk.* Report of Committee on Milk Supply. Am. Public Health Ass., Bost., 1920, 32 pp.

This is a reprint of a report made before the Sanitary Engineering Section of the A. P. H. A. and was drawn up by a committee consisting of H. A. Whittaker, Chairman, H. D. Pease S. M. Heulings, A. F. Stevenson, Mayo Tolman and Ralph E. Irwin. The matters discussed in the report are indicated by the table of contents as follows: 1. Introduction. 2. The present status of milk pasteurization. 3. The effect of pasteurization on the composition of milk. 4. The process of milk pasteurization. 5. The mechanical features and the operation of pasteurization plants. 6. Analytical control of pasteurization plants. 7. State and municipal supervision of the pasteurization of milk. 8. Summary.

The committee holds that there is little, if any, change in the chemical composition of milk by proper pasteurization so far as can be determined by chemical analysis. The "holding" system is held to be so much superior to any other system as to justify its universal application for the pasteurization of milk to be used for human consumption, and the temperature and time recommended are 145°F. for not less than 30 minutes. It is held that the state should at least set minimum standards for the control of milk pasteurization, which may be supplemented by municipalities to fit their particular needs.—R. S. B.

602. *Milk-Powder Agar for the Determination of Bacteria in Milk.* S. Henry Ayers and Courtland S. Mudge. J. Bact., Balt., 1920, **5**, 565–588.

Three skimmed milk powder agar media are described which appear to be particularly well suited to the accurate determination of bacteria in milk. They give total counts very much higher (0–75,000 per cent) than those obtained on standard meat-extract agar; the colonies are larger and more easily counted; the bacteria may be differentiated into those which are strong acid-formers, weak acid-formers, casein peptonizers, and alkali-formers or inert. The type differentiations are made by making a total count and then flooding the plate first with brom-cresol-purple and then with 5 per cent acetic acid solution. Two of the milk powder media contained skimmed-milk powder and varying amounts of meat extract and peptone; the third contains milk powder and extract of pure, dry, fresh yeast. A specially (yet easily) prepared "washed" agar is used in these media. The preparation of these media is very carefully and fully described. The procedures are simple and quite rapidly accomplished. Two of the media cost about as much as ordinary standard extract agar; the third costs only a little more than half as much. Because these milk powder media lend themselves to more accurate quantitative determination of bacteria in milk as well as to qualitative differentiations they are recommended for consideration to replace the accepted standard medium for milk examination.—I. S. F.

603. *Judging the Keeping Quality of Milk by a pH Method.* L. H. Coolidge and R. W. Wyant. Am. J. Pub. Health, Chicago, 1920, **10**, 978–979.

One-tenth cc. of each sample of milk is added to 10 cc. of broth-indicator, broth to which brom-thymol blue is added, and the whole incubated at 37°C. At the end of one hour periods the samples are examined and where a marked change is noted the pH is determined colorimetrically. Some samples showed a change at the end of 1 or 2 hours while the better samples showed little change at the end of 8 hours.—M. C. P.

604. *Detection of Manural Pollution in Milk by the Anaerobic Spore Test.* John Weinzirl. Am. J. Pub. Health, Chicago, 1921, **11**, 149–152.

This article seems to show that the anaerobic spore test is superior to the total count or *B. coli* test and is the only one applicable to pasteurized milk.—M. C. P.

605. *Reduktaseprőven sammenlignet med andre Bakterietaellings methoder, isaer anvendt paa Maelken fra enkelte Köer.* (*The Reduction Test Compared with Other Methods of Counting Bacteria, Used on the Milk from Different Cows.*) C. Lind. Maelkeritidende, Copenhagen, 1920, **33**, 207–218.

The author summarizes his results as follows:

I. The mixed milk gave a normal result with the reduction test.

II. Milk from individual cows also gave normal results with the reduction test with the exception of milk which developed a great deal of catalase, was rich in leucocytes, or came from cows far advanced in the lactation period and gave only small quantities of milk. Such milk was reduced very quickly in comparison with its bacterial count.—L. A. R.

COMPARATIVE PATHOLOGY

(*See also Numbers 656, 728, 828*)

606. *Hemorrhagic Septicaemia of Domesticated Animals.* Edwin Laitinen. Vet. Med., Chicago, 1921, **16**, 25–29.

The author discusses hemorrhagic septicemia in its various forms and frequency of occurrence in farm animals. The writer is of the opinion that this infection is found most often among swine, cattle come second from the standpoint of susceptibility, while horses are only occasionally affected. In sheep the disease appears usually as an enzootic and is often associated with internal parasites. The mortality of hemorrhagic septicemia in poultry is said to be rather high. Hemorrhagic septicemia as it occurs in dogs and rabbits is described. In the treatment of hemorrhagic septicemia it must be admitted that the biological agents have been the sheet anchor. Medicinal treatment in addition has been used in the different species except swine and rabbits. Serum and bacterins of the specified organism have been given whenever possible. So-called "breaks" following the injection of anti-hog cholera serum and virus have been largely controlled by the administration of hemorrhagic septicemia bacterins at the time of the simultaneous treatment.—W. L. B.

607. *Malléination sous-cutanée suivie de mort.* (*Fatal Subcutaneous Malleination.*) Rémound and Charcot. Rec. méd. vét., Par., 1920, **96**, 525–527.

Report of fatal case of malleination, characterized by persistence and intensity of local reaction which from the start covered the entire right side of the neck with edema of the subscapular region, arm, forearm, brisket and knee.—W. G.

608. *Das rote Blutbild bie Infektionskrankheiten des Pferdes.* (*The Red Blood Corpuscles in Infectious Diseases of the Horse.*) H. Lochtkemper. Monatsh. f. Prak. Tierheil., Stuttg. 1920, **31**, 159–181.

The numerous blood investigations of horses conducted at the Clinic of the Veterinary High School at Berlin suggests that the findings of five to six million red blood corpuscles indicate a slight anemia, four million a moderate and two to three million a severe anemia. The examination of the blood of horses, affected with different infectious diseases established in all febrile infections an anemia of a varying degree. Morphological changes of a regenerative character in the red blood corpuscles were not present. Of a degenerative character they were found in the form of a anisocytosis and less frequently as a poikilocytosis. Glanders especially runs the course of a severe secondary anemia. No relation could be established between the extension and the age of the glanderous processes and the degree of anemia. A distinct anemia was observed even in cases of glanders which according to the pathological finding could not have existed more than from 2 to 3 weeks. In very recent infections, with negative clinical and pathological-anatomical findings, but with positive serological tests, positive ophthalmic mallein tests and leucocytosis, no anemia could be demonstrated. Accordingly anemia in glanders develops even in relatively recent infections.—A. E.

609. *Das Blutbild des gesunden Schafes. Uebertragungsversuche mit infektioser Anämie bie Schafen.* (*The Blood Picture of Healthy Sheep. Transmission Experiments with Infectious Anemia of Sheep.*) F. Schantz. Monatsh. f. Prak. Tierheil., Stuttg., 1920, **31**, 131–159.

The composition of sheep blood shows marked physiological fluctuations. Sheep are not susceptible to infectious anemia. For this reason sheep are not adopted as experimental animals for investigations or diagnosis of infectious anemia in horses. These results confirm the findings of the Japanese Commission appointed for the study of infectious anemia of horses.—A. E.

610. *Das Blutbild des gesunden Schweines.* (*The Blood Picture of Healthy Hogs.*) O. SENFTLEBEN. Monatsh. f. Prak. Tierheil., Stuttg., 1919, **30**, 289–313.

The normal number of erythrocytes in hogs varies between 2,892,000 and 9,600,000 per cmm. The lowest number occur in the second week of life and increases from then on up to the fourth month. It remains then for a long time at the uniform height, approximately 7.2 millions and drops again in four year old animals to 6.3 millions. The number of leucocytes in hogs is very large when compared with the number in man and large domestic animals. In young animals the number is smaller, averaging about 11,323. Later it is higher and averages 20,000. The lymphocytes represent the greatest proportion of all leucocytes constituting approximately 57 per cent of the total number. Then follows the neutrophils with 36 per cent. The hogs, therefore, similar to cattle have a high lymphocytic and a low neutrophilic count. The neutrophils, eosinophils and basophils as compared with those of man and the horse are characterized by the fineness of their granules. There is a marked distinction between the red blood corpuscles of the hog and those of the horse and man. Aside from the usual orthochromatic erythrocytes the circulating blood of young pigs contains polychromatic cells and normoblasts in great numbers, even under normal conditions. Hemoglobin contents of the hog blood is in young hogs relatively low and amounts during the suckling period to about 48°. The hemoglobin content rises rapidly after the ingestion of the first feed containing considerable iron and then on the whole runs parallel with the number of erythrocytes. However, in older animals it does not drop with the erythrocytes but remains stationary at 90 to 100°. The specific gravity of normal hog blood is 1042–1055, on an average 1050.—A. E.

611. *Dourine of Horses.* J. R. MOHLER AND H. W. SCHOENING. U. S. Dept. Agric. Farmers Bulletin 1146, 1920.

Dourine under natural conditions affects only the horse and ass. It is caused by a microscopic animal parasite, the *Trypanosoma equiperdum*, and is transmitted from animal to animal by coition. The paper discusses the cause and transmission of the disease, symptoms, course and outcome, post mortem lesions, diagnosis, treatment, and method of eradication.—S. H. A.

612. *Su coagglutinazione delle emazie e l' agglutinazione macroscopica die tripanosomi nella diagnosi di morbo coitale maligno.* (*Conglutination of the Blood Corpuscles and Macroscopic Agglutination of the Trypanosomes in the Diagnosis of Dourine.*) G. MARCONI AND F. DEGASPERI. Clin. vet., Milano, 1921, **44**, 1–4.

The authors, in connection with the investigation of an outbreak of dourine, made parallel tests of "auto and iso" conglutination of the blood corpuscles and of macroscopic agglutination of trypanosome suspensions.

The conglutination tests were made, for "auto" conglutination with a drop of blood placed between a slide and cover slip, for "auto and iso" conglutination in a watch glass with washed corpuscles and the respective sera undiluted and in serum reaction tubes with a 5 per cent suspension of corpuscles and the respective sera in graduated proportions. The macroscopic agglutination of trypanosome suspensions was performed by the method of Sange. The authors state that they met some difficulties in applying this method, but that if due care is observed good results may be expected.

Using these methods they examined 18 horses, some sick and some healthy, and came to the following conclusions:

Conglutination:

(1) Auto conglutination between slide and cover slip.

This test offers no certainty of result, considering that there were positive results, more or less marked, with the blood of all the horses examined.

(2) Auto and iso conglutination of blood corpuscles in a watch glass.

This test, even when examined with discernment in comparison with the necessary controls offers no certainty of judgment, also when made at different times it appears that the the phenomenon is not present in equal constancy and intensity during the course of the disease.

(3) Auto and iso conglutination of blood corpuscles in serum reaction tubes.

The results of this test are like those of the preceding test, although corresponding more closely to the dilutions of serum.

Macroscopic agglutination of the trypanosomes:

This test offers a solid basis for certainty of judgment, since; (1) the changes in the appearance of the suspensions of the parasite are definite, likewise the time in which they appear; (2) there is a marked difference in the characteristics of the same suspensions used with sera of sound horses and with sera of sick horses; (3) the agglutinating power of the sera of sick horses as a rule has a very high titer, reaching even 1:20,000, while that of sound horses is not enough to amount to anything, sometimes a partial action up to a maximum titer of 1–200; (4) the reaction was verified by the sera of horses which during the test, and also afterward, presented indubitable manifestations of dourine (preputial edema, orchitis and epididymitis, cutaneous plaques, asynmetrical edema of the eyelids and conjunctival catarrh, small multiple areas of alopecia).—F. W. T.

613. *The Control of Infectious Abortion in Mares.* E. S. Good. Vet. Med., Chicago, 1921, **16**, 23–24.

Infectious abortion in mares is described as an acute disease, caused by a short plump bacillus known as the *Bacillus abortivo-equinus.* The disease spreads rapidly through a herd and in all probabilities has no connection with infectious abortion of cattle. Experiments indicate that mares can be successfully immunized against this infection by the use of bacterins. Field results in the use of bacterial vaccine for the control of this malady have been very encouraging.—W. L. B.

614. *Die Beziehungen der Gastrophilus-Larven zur infektiosen Anämie.* (*The Relation of Gastrophilus Larvae to Infectious Anemia.*) A. Marxer. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 1–10.

This paper contains a discussion of the hypothesis that the pernicious infectious anemia of horses is caused by the larvae of *Gastrophilus.* The author supplements this review with experiments which show that while the extracts of the larvae are undoubtedly toxic for rabbits and horses, they do not lead to an infectious disease which can be transmitted from one animal to the other. Repeated injections of the extracts of the larvae are followed by edema, dyspnea, pyrexia and a progressive anemia. The blood picture of the anemia is not described. He likens the extract of the larvae to bacterial endotoxins and to the anaphylatoxin of Friedberger. His conclusions are that the larvae of *Gastrophilus* do not stand in any causal relationship to infectious anemia, and that the pernicious anemia produced by the injections of extracts of the larvae is an anaphylactic phenomenon.—S. B-J.

615. *The Treatment of Joint-Ill in Foals with the Dam's Blood.* Gerh. Forsell. J. Am. Vet. M. Ass., Wash., 1921, **58**, 663–675.

The author believes that the dam is the common carrier of the virus of joint-ill and that the foal is frequently affected *in utero* or at the time of parturition. It is also suggested that the intestines of the dam may harbor the organism or virus. Even though a mare does not suffer from the infection it is believed that her blood carries antibodies against it, and may be used in the treatment of the infection in the foal. In order to avoid the delay which would be necessary if the serum is to be used, the blood of the dam is injected. Sodium citrate is added to the whole blood to prevent coagulation and this is injected directly into the foal either subcutaneously or intravenously. A number of case reports are given.—W. A. B.

616. *Mal de garrot traité par auto-vaccination.* (*Fistula of the Withers Treated by Antogenous Vaccine.*) Cappelle and Crèvecoeur. Ann. de méd. vét., Brux., 1920, **65**, 260–263.

On October 3, 1919, a horse was presented for treatment. The animal showed extensive development of fistulous withers involving the aponeuroses of the trapezius and rhomboideus muscles, directed toward the spinous process of the first thoracic vertebra, and parallel to the median line extending toward the cervical region. Curettage was performed, followed by daily irrigations with antiseptics. Examination on November 25 showed extension of the suppurating process. An antogenous vaccine was prepared from the purulent discharge, the exciting organism being a streptococcus exceedingly virulent for mice. On December 2, 4 cc. of the "bacillase" (prepared as a bacterin, killed by heating) was injected subcutaneously. The daily superficial antiseptic irrigations were continued. A severe general and local reaction was produced by the first injection. Following this, injections of the "bacillase" were continued every few days, the frequency depending upon the degree of reaction obtained. In all, 13 injections were given, the final one being administered on February 1, 1920. On February 5 all signs of the infection had disappeared and the animal was considered cured. The dosage (strength not stated) ranged from 4 to 8 cc. at each injection.—D. C. B.

617. *Au sujet d'une rhinite observée chez le cheval.* (*On the Subject of Rhinitis Observed in The Horse.*) Pommier. Rec. méd. vét., Par., 1920, **96**, 527–530.

The rhinitis was contagious and inoculable. A Gram-positive cocco-bacillus was isolated. It grew well on bouillon, and liquefied gelatin. The disease is ephemeral, benign and healing is spontaneous.—W. G.

618. *Sur le diagnostic de certaines formes de lymphangite épizootique.* (*The Diagnosis of Certain Types of Epizootic Lymphangitis.*) Brocq-Rousseu and Forgeot. Rec. méd. vét., Par., 1920, **96**, 589–591.

Epizootic lymphangitis does not always present the classic picture of the disease. Two atypical cases in point are described.—W. G.

619. *Observations sur la dermite granuleuse.* (*Observations on Granular Dermatitis.*) R. Van Saceghem. Ann. de méd. vét., Brux., 1920, **65**, 135–136.

The article includes a brief description of lesions, and treatment for granular dermatitis, as it occurs among the horses and donkeys of Zambi, Africa. The disease described is produced by a small nematode worm, 3 mm. in length and known as "*Filaria irritans,*" and is found located in the lesions, (localizing especially in the region of the legs, between eyes and nose, eyelids, ribs and withers). The parasites are included within small cysts in the skin. The affection is prevalent only during the warm season of the year. Prognosis of affected animals is relatively grave because of tenacity of the sores, and also because of complications which may supervene.—D. C. B.

620. *Diptheria Bacilli in the Horse.* F. C. MINETT. J. Comp. Path. & Therap., Edinb. & Lond., 1920, **33**, 267–293.

Bacilli that were proven to be identical with human diptheria bacilli were isolated from 11 horses and 1 mule. Nine of the animals presented lesions on the limbs that were described as being like those of ulcerative lymphangitis. One of the other animals showed cutaneous lesions somewhat resembling those of acne. The remaining animal had a case of suppuration of a nasal sinus in which treatment by trephining had been tried without success. Five of the strains isolated were toxic, 7 exhibited no evidence of toxicity.—C. E. H.

621. *Contribution á l'étude des "plaies d'été" (Habronmose cutanée des equines). (A Contribution to the Study of Summer Sores, Habronemosis of Equines.)* G. SPITZ. Rec. méd. vét., Par., 1920, **96**, 208–216.

A general treatise on the disease which the author observed in Argentina. The disease has cutaneous, pulmonary and gastric manifestations. Granular dermatitis, the primary cutaneous form, is a wound infection, and the vector of the *Habromema* is probably the house fly, not the stable fly.—W. G.

622. *La fièvre aphteuse. (Aphthous Fever.)* G. MOUSSU. Rec. méd. vét., Par., 1920, **96**, 193–208.

An account of some field tests with a citrated virulent blood for foot and mouth disease is given. The blood taken from affected cases, carefully administered intravenously was without danger, but was practically of no value as a therapeutic agent. As a prophylactic it resulted in a benign or abortive type of the disease.—W. G.

623. *Sur la fièvre aphteuse. (Aphthous fever.)* M. FREGER. Rec. méd. vét., Par., 1920, **96**, 369–375.

A general article with special reference to the epidemic of 1911. Immunising seru is considered only theoretically efficacious. Slaughtering gives good results in isolated localities. Sanitary measures are ineffective. Aphthization is recommended under certain conditions.—W. G.

624. *La fièvre aphteuse. Dangers de l'aphtisation par l'emploi du serum virulent. (Aphthous Fever. Dangers of Aphthization through the Use of Virulent Serum.)* CHARLES LEBAILLY. Rec. méd. vét., Par., 1920, **96**, 591–593.

Reference is made to article by Moussu (Abst. Bact., 1921, No. 622). These cases were treated by a method differing a little from that used by Moussu. Virulent blood serum instead of citrated blood and very weak dosage were used. A half centimeter dose proved fatal. The writer exhorts experimenters to prudence in the use of virulent blood.—W. G.

625. *La lucha contra la fiebre aftosa. (The Struggle against Foot and Mouth Disease.)* JOSÉ LIGNIÈRES. Rev. zootec., Buenos Aires, 1920, **7**, 467–486.

A treatise on the nature, principal symptoms, the paths and means of spreading, the virus, study of appropriate methods for combating, the sero-therapy, chemo-therapy, sanitary measures, methods of treatment, etc., of foot and mouth disease, with the purpose in mind of realizing the greatest and most effective results in its control and treatment.—H. M.

626. *A Review of Several Publications on Infectious Abortion Disease.* E. C. SCHROEDER. J. Am. Vet. M. Ass., Wash., 1920, **57**, 270–281.

The author reviews and comments on the publications by Smith, Smillie, Gimper, Simms, Dick, Taylor, Little and Florence. He concludes that the Bang bacterium paves the way for the Smith spirillum to act, and that whatever else the data in the various articles may signify, they do not in any measure tend to detract from the great economic importance of the Bang organism.—C. M.

627. *A Study of an Unusual Case of Sterility in Young Heifer.* W. L. BOYD AND D. C. BEAVER. North Am. Vet., Chicago, 1921, **2**, 75–79.

This article presents the results of a careful study of a pure bred Shorthorn heifer which failed to conceive. Included are both bacteriological and pathological findings, and as a result the authors come to the following conclusions: (1) *Bacillus pyogenes* seems to be the most virulent of the organisms present, and responsible for the chronic changes observed; (2) This appears logical to us, for *B. pyogenes* has never been observed in our studies on sterility except in purulent inflammations of the genitalia, and appears to be almost always present under such conditions; (3) The chronic changes described include: First, abscess in right ovary; second, cyst in left ovary; third, adhesions about ovaries, bringing them closely in contact with the uterus; fourth, purulent salpingitis; fifth, pyometra; sixth, atrophy and cystic degeneration of many uterine glands; (4) This combination of conditions justifies the diagnosis of incurable sterility.—C. P. F.

628. *Ueber das Vorkommen von kokkenähnlichen Gebilden in den Lungenexsudaten von Tieren, die an Lungenbrustfellentzündung leiden (ansteckende Lungen brustfellentzündung der Ziegen, Schweinepest usw). (On the Occurrence of Coccus-like Bodies in Lung Exudates of Animals Affected with Pleuropneumonia. Contagious Pleuropneumonia of Goats, Hog-Cholera, etc.)* Dr. SCHELLHASE. Ztschr. f. Infektionsk. d. Haustiere, Berl., 1919, **20**, 63–64.

Coccus-like bodies were found in large numbers in smears from pleural exudates of animals affected with pleuropneumonia, in German East Africa. Diameter of bodies, close to 0.001 mm. No structures detectable under highest magnification; bodies are easily stained with carbol-fuchsin, methylene blue, etc. They were found in a hog, goats, cattle, gazelle. Their significance is not known. They may be either microorganisms or albumin coagula.—W. N. B.

629. *Las vacunas anticarbunclosas no esporuladas y las esporuladas. (Sporogenous and Non-sporogenous Anti-anthrax Vaccine.)* JOSÉ LIGNIÈRES. Rev. zootec., Buenos Aires, 1920, **7**, 357–360.

A discussion of the comparative value of non-sporogenous vs. sporogenous vaccine against anthrax. The conclusions are that the immunological properties of the sporogenous vaccines are inconstant, of short duration, and the immunity which they produce is not as certain as with the non-sporogenous which are superior in their immunizing qualities, and more extended immunity induced. There may be times, because of distance or transportation difficulties, when the former must be used but the non-sporogenous is to be preferred, when it is expedient. The writer calls the attention of the public to the numerous inferior sporogenous vaccines on the market in the Argentine and urges active supervision over their production to safeguard the cattle men against vaccines which do not possess any immunizing properties.—H. M.

630. *Ueber Rinderpest. Ueber Resistenz und Inkubation bei der Experimentellen Rinderpest anatolischer und podolischer Rinder. (On Rinderpest, On Immunity and Incubation Period of Rinderpest Experimentally Induced in Cattle in Asia Minor.)* K. SCHERN, N. MAVRIDES AND A. MAJOR. Ztschr. f. Infektionsk. d. Haustiere, Berl., 1919, **20**, 117–121.

Cattle in Asia Minor are more resistant to rinderpest than those of European origin and the disease does not run the same course. The incubation period of 3–9 days generally stated is too short. Large numbers of cattle were infected by subcutaneous and intraperitoneal injection of infectious defibrinated rinderpest blood and cerebrospinal fluid. Out of 2350 such animals, 524 or 29 per cent were immune to the virus. Frequently the incubation period was 10, and up to 15 days. Quarantine for 10 days is therefore not sufficient.—W. N. B.

631. *Botulism in Cattle.* F. H. BURT. North Am. Vet., Chicago, 1921, **2**, 63–64.

The writer is of the opinion that the so-called cornstalk disease and forage poisoning are none other than botulism.

The mode of infection, clinical symptoms and treatment are described. Case reports are included—W. L. B.

632. *Mastitis of the Cow.* C. F. DAVIS. North Am. Vet., Chicago, 1921, **2**, 107–109.

The writer classifies mastitis as follows: (1) Interstitial or phlegmonous; (2) catarrhal; (3) parenchymatous. Most cases of catarrhal mastitis are caused by bacteria, usually streptococci; sometimes by staphylococci or the *Bacillus pyogenes*. The author advises the use of bacterins in the treatment of mastitis especially where there is abscess formation. Medicinal agents such as phytolacca ointment and fluid extract of phylotacca are recommended also.—W. L. B.

633. *Etude complémentaire sur la dermatose contagieuse (Impétigo contagieux). (Complemental Study upon Contagious Dermatitis.)* R. VAN SACEGHEM. Ann. de méd. vét., Brux., 1920, **65**, 129–132.

In a previous article (Ann. de méd. vét., 1920, **65**, 75) the author reported upon the existence of the disease named above, and also upon the isolation of the specific infective agent, "*Dermatophilus congolensis*." In this paper the cultural and morphological characters are described. The organism is associated with a specific skin disease found in cattle, sheep and camels of the Belgian Congo. In the crusts from the lesions the organism assumes two forms:

1. Filaments, either straight or curved, with many branches, variable length, that may attain 1 mm. The filaments are composed of a homogenous substratum in which fine granules may be seen.
2. Isolated granules (cocci) which are capable of giving rise, by successive division, to filamentous forms. These are the reproductive elements, and are especially resistant.

The organism was previously described by the author as belonging to the fungi, but by Mesnil and Pinoy, the parasite is placed in the class of "bactérise," especially belonging to the "bactériennes filamenteuses." Growth is best accomplished on sterile donkey serum, where it appears always as an obligate anaerobe. Optimum temperature is between 26° to 30°C.

Phenolized petrolatum in strength of from 5 to 10 per cent strength, is an absolutely specific treatment.—D. C. B.

634. Erfahrungen mit der Ascolischen Prazipitinreaktion zum Nachweise des Milzbrandes. (*Experiences with Ascoli's Precipitation Reaction for the Diagnosis of Anthrax.*) R. REINHARDT. Monatsh. f. Prak. Tierheil., Stuttg., 1920, **31**, 268–275.

In the numerous cases tested, a precipitation reaction proved very dependable and accurate. The reaction should be considered not only as a valuable diagnostic aid, but also as an easy and certain method for the diagnosis of glanders. In its reliability it comes up to any of the other tests; in fact under certain conditions it possesses even superiority. The method is especially valuable in those cases in which as a result of advanced putrefaction the anthrax bacilli have been destroyed and spores could not form as a result of unfavorable conditions and in which, therefore, the bacteriological examination of smears, the cultural methods and animal tests are more or less unreliable.—A. E.

635. The Bacterial Content of the Genital Tract of Cattle and its Relation to Calf Infection. C. M. CARPENTER. J. Am. Vet. M. Ass., Wash., 1921, **58**, 676–683.

The genital organs of 114 animals were studied. The author isolated streptococci from 138 different parts, staphylococci from 78, *Bact. abortum* from 29, organisms of the colon-aerogenes group from 4, *Bacillus aerogenes capsulatus* from 3, *Bacillus pyogenes* from 3, sarcina from 3, *Pseudomonas pyocyaneus* from 1 and saccharomyces from 1. It is concluded from this data that the genital organs of cattle should normally be free from bacteria. It is pointed out that organisms of the colon-aerogenes type are rarely encountered.—W. A. B.

636. Bovine Coccidiosis in British Columbia, with a Description of the Parasite, Eimeria canadensis Sp. N. E. A. BRUCE. J. Am. Vet. M. Ass., Wash., 1921, **58**, 638–662.

The author describes 4 outbreaks of this disease which occurred in British Columbia. The symptoms, diagnosis and autopsy findings are given in detail. Three different species of flagellates and an ameba were observed. Injection experiments were also carried on. A detailed description of the parasite is given. Animals of all ages are affected. The large intestine is more often affected in adult animals, while in calves the small intestine is more often the seat of involvement.—W. A. B.

637. Tuberculosis in Milk Goats. G. E. GOLDEN. J. Am. Vet. M. Ass., Wash., 1921, **59**, 79–81.

In view of the supposition of the relative freedom of milk goats from tuberculosis, the author reviews the history of a herd of goats which were imported into this country from Switerzerland. The tuberculin test was found to be efficient in the diagnosis of this disease in goats. Goats may be badly affected and still appear in good physical condition. The autopsy findings in several cases are given.—W. A. B.

638. Etiology of Infectious Abortion in Swine. W. W. DIMOCK. North Am. Vet., Chicago, 1921, **2**, 19–20.

The author is of the opinion that abortion in swine is on the increase. A thorough review of the history of many herds would no doubt bring out evidence to show that abortion had occurred in the past much more frequently than is generally known. The cause of abortion in swine is supposed to be the *B. abortus suis* and is physiologically and biologically identical with the *B. abortus* (Bang).—W. L. B.

639. Some Observations on the Diseases of Swine. F. M. GALLIVAN AND H. E. PINKERTON. North Am. Vet., Chicago, 1921, **2**, 109.

The writers are of the opinion that the present knowledge of swine diseases is more or less confusing, and the reasons for this are due to our limited information of the history, symptomatology and pathology of a group of closely associated diseases of swine. Until we accept the known fact that swine are susceptible and occasionally succumb in large numbers to at least 4 separate and distinct specific diseases, namely, hog cholera, protein poisoning, hemorrhagic septicemia, and necrotic enteritis, and these diseases to have a more or less consistent history, symptomatology, and pathology, and until each one of us is capable of differentiating between these various diseases, little or no progress can be made in clarifying this situation.—W. L. B.

640. Clarified Anti-Hog-Cholera Serum. D. I. SKIDMORE. North Am. Vet., Chicago, 1921, **2**, 104–107.

A history of the manufacture of anti-hog-cholera serum by the Bureau of Animal Industry and commercial firms is given. The comparative values of the clarified serum and defibrinated blood serum is given. Clear serum is becoming more popular, and is in great demand by the breeders of pure bred swine. The characteristics of clear serum are summed up as follows:

1. The removal of the corpuscles of hyperimmune blood make it possible to heat the serum recovered without material impairment of its protective value. This heating kills or renders innocuous, the ordinary pathogens with which the product may be accidentally contaminated and with which hogs and other animals may be affected. It also improves the keeping qualities of the serum by destroying putrefactive organisms.

2. The corpuscles are of proteid composition, and in effect are foreign bodies difficult to preserve. They interfere with proper and rapid absorption of the product and for these reasons may be responsible for abscesses or other forms of tissue destruction.

3. The fluidity of clear serum is increased by the elimination of the inert corpuscles and cell debris, thus facilitating its administration.—W. L. B.

641. *Praktische Versuche zur Prüfung des Wertes der Schutzimpfung gegen Schweinepest.* (*Practical Investigation of the Value of Vaccination against Hog Cholera.*) W. Pfeiler. Ztschr. f. Infektionsk. d. Haustiere, Berl., 1919, **20**, 1–25; 132–171; 218–259.

An extended investigation of the value of using hog cholera serum in 15 herds, in many of which the disease had appeared. Of hogs injected with normal serum, 67 per cent died; of hogs injected with European makes of hog cholera serum, 65 per cent died. The mortality was 100 per cent in some of the herds; the serum-alone method was used. In some herds the serum injection was made soon after the outbreak of the disease, with good results. This was regarded as a coincidence. In lightly infected herds where few animals succumbed, the injected animals were actually protected by the serum injection; the difference disappeared as the infection became severer, i.e., there were more deaths among the uninjected hogs than the injected, when infection was light; the number of deaths approached equality as the infection became more severe. A trial of the simultaneous method of serum and virus injection is regarded as advisable.—W. N. B.

642. *Etude sur uné epizootie pami les gortes de la station d'élevage de Zambi.* (*A Study on an Epizootic among the Pigs of the Breeding Station of Zambi.*) R. Van Saceghem. Ann. de méd. vét., Brux., 1920, **65**, 132–134.

An epizootic among the pigs of from 1½ to 3½ months of age, occurring at the breeding station of Zambi is described in this paper. Older animals are not affected by the disease. The symptoms produced are very vague, a paralysis of the posterior quarters with localized swellings in the region of the tibia. The animals remain decumbent and refuse all nourishment. Sensibility to pain is unchanged so that the paralysis is only of the motor tracts. Frequently epileptiform fits are seen especially when the animals are stimulated to move. The symptoms seem to be those of myelitis, more especially leucomyelitis. Temperature raised to between 40 and 40.5°C. during the course of the disease. Blood examination shows a marked leucocytosis. Cultures from the blood, spleen and nervous tissue have shown the presence of an organism closely resembling *B. paratyphosus* B. With these, however, it is not possible to reproduce the disease in pigs or experimental animals, neither is it possible to reproduce the condition by inoculation of blood from diseased animals to susceptible ones.—D. C. B.

643. *Die Leukämie beim Hund.* (*Leukemia in the Dog.*) D. Wirth. Monatsh. f. Prak. Tierheil., Stuttg., 1920, **31**, 97–130.

The investigation of the blood of 13 dogs affected with leukemia proved to be in 11 of the cases a myelogenic leukemia and in 2 cases a lymphatic leukemia. The cases considered as myelogenic differ markedly from the typical myelogenic leukemia in man. The blood picture simulates more the pronounced cases of leucocytosis. In considering the blood picture, these cases in dogs should be designated according to the nomenclature in human medicine as myelogenic aleukemias or subleukemias. The blood picture of the lymphatic leukemia of the dog, however, has a greater resemblance to the human lymphatic leukemias.

A typical myeloid leukemic blood finding in the sense as it occurs in human medicine has not as yet been observed in domestic animals.—A. E.

644. *La pseudo-tuberculose zoolgléique chez le chat.* (*Zooglooic Pseudo-tuberculosis of the Cat.*) Ch. Leblois. Rec. méd. vét., Par., 1920, **96**, 307–310.

The disease is caused by a Gram-negative cocco-bacillus described by Viguol and Malassez in 1883. Case reports are given and a description of the lesions from the standpoint of differential diagnosis.—W. G.

645. *The Efficiency of Chloroform and Thymol against Hookworms in the Silver Fox.* J. A. Allen. J. Am. Vet. M. Ass., Wash., 1921, **59**, 62–72.

Fox breeding is briefly presented together with some of its problems. It is pointed out that an increasing percentage of foxes are now developing undesirable texture and quality of fur. All poorly furred foxes do not harbor hookworms, but 68 per cent of the woolly and stunted foxes used in this work did have hookworms. Chloroform is inefficient and dangerous to use. Thymol is more effective and less dangerous than chloroform as an anthelmintic against hookworms in the silver-black fox. A series of experimental data is given.—W. A. B.

646. *A Spontaneous Epidemic among Laboratory Rabbits Caused by a Paratyphoid B Bacillus Related to the Rodent Group.* V. M. Litch and K. F. Meyer. J. Infect. Dis., Chicago, 1921, **28**, 27–42.

Among some rabbits purchased for the laboratory, one animal was found to have diarrhea and signs of a recent abortion. Several of the animals, which had been in contact with this rabbit, developed diarrhea and extensive "croupous" pneumonia, and died. Cultures from the lungs of these animals yielded a variety of the paratyphoid B bacillus. It was possible later to infect other rabbits by feeding them this organism, though the infection produced by inoculation with the cultures was less severe than the spontaneous infection.

The chief pathological lesions in the rabbits were: emaciation, fibrinous pleurisy, and lobar pneumonia. A detailed description is made of the gross and microscopic anatomy of all the organs of the infected animals.

The organism recovered from the lesions was a Gram-positive, motile bacillus, which fermented with gas production glucose, maltose, levulose, mannite, galactose, dulcite, mannose, arabinose, sorbite, rhamnose and xylose. It had no action on lactose, sucrose, dextrin, and inulin. Its action on inosite was slow. It reduced lead acetate and glucose serum water. Gelatin was not liquefied and no indol was produced. Its agglutinations were those of the suipestifer-paratyphoid group, and it was not affected by an anti-enteritidis serum. Absorption tests further placed it in the "animal paratyphoid group," probably showing it to be one of the rodent strains. In veal infusion broth plus 0.1 per cent glucose, with pH 8.4, it produced a highly potent toxin. 2.5 cc. of a filtrate of a 72-hour culture killed a 2500 gram rabbit in 14 hours.—S. B-J.

647. Experiments in Avian Toxicology. B. A. GALLAGHER. J. Am. Vet. M. Ass., Baton Rouge, 1919, **54**, 337–356.

In general, fowls may be considered as having approximately the same susceptibility to toxic substances as medium sized dogs. They are more resistant to calomel, strychnine and tartar emetic, and less to phenol, salicylic acid and potassium cyanide. It is recommended to utilize the drinking water as a vehicle for medication of fowls. Absorption through the wall of the crop is very rapid, symptoms of poisoning with such substances as ammonium chloride, potassium cyanide and strychnine sulfate appearing in from 2 to 5 minutes after administration.—C. M.

648. Paratyphoid Bacilli from Chicks. R. S. SPRAY AND L. P. DOYLE. J. Infect. Dis., Chicago, 1921, **28**, 43–47.

This study was based upon 21 strains of paratyphoid-like bacilli freshly isolated from cases of white bacillary diarrhoea of chickens 2 to 4 days old. These strains were compared among themselves and also with typical strains of *B. gallinarum, B. pullorum, B. enteritidis, B. paratyphosus* A and B and *B. typhosus.* The data presented are mostly cultural. Agglutination tests were made also, but apparently group reactions based on absorption of agglutinins were not attempted.

The authors found that 20 of the strains isolated by them were identical with *B. pullorum.* One new type was found, which closely resembled *B. paratyphosus* B, but which was agglutinatively distinct.

There were a number of irregular fermentation reactions, as the same strain did not always produce the same result by its action on a carbohydrate. In addition, the fermentation of a carbohydrate was found to be dependent upon the medium containing the sugar. Thus all the strains isolated in this epidemic as well as the control strain of *B. pullorum,* which is usually regarded as being unable to ferment maltose, produced acid and gas from maltose in 1 per cent serum water, while maltose in infusion broth was not fermented. The serum water did not contain any other fermentable sugar.—S. B-J.

649. Aktive Immunisierung gegen die Geflügelcholera. (Active Immunisation against Fowl Cholera.) A. SZASZ. Ztschr. f. Infektionsk. d. Haustiere, Berl., 1919, **20**, 26–62.

Out of 7426 immunized animals, 212, or 3 per cent died, at the same time out of 854 not immunized, 291, or 34 per cent died. The immunizing agent is an attenuated vaccine prepared from a highly virulent strain of fowl cholera bacillus. Details of preparation are not given.—W. N. B.

650. Observations Regarding Pathological Conditions in Fowls. B. F. KAUPP. J. Comp. Path. & Therap., Edinb. & Lond., 1920, **33**, 294–307.

A considerable number of diseases in fowls is noted and described. The descriptions are written from the personal observations of the author.—C. E. H.

651. Coccidia as a Cause of Quail Disease. B. A. GALLAGHER. J. Am. Vet. Ass., Wash., 1921, **59**, 85–88.

Quails imported into this country frequently suffer from a disease in which the intestines are the chief seat of the lesions. These take the form of small areas of necrosis and sometimes perforate the intestinal wall. The liver may also show these areas of necrosis. From the included experimental work the author concludes that the disease is due to a coccidium. *B. coli* is not believed to have any etiological importance.—W. A. B.

652. Physiological Method as a Key to the Causation of Isle of Wight Disease in Bees. JAMES M. MCQUEEN. Nature, Lond., 1920, **106**, 376.

It was found that apparently bees infected with Isle of Wight disease consumed in a given time much less oxygen than healthy controls. This observation caused the conclusion to be drawn that the symptoms of this disease were due to blocking of tracheal tubes and anoxemia. Later by anatomical study this blocking or disturbing effect in the tracheal tubes was found to be due to a parasite.—Z. N. W.

PARASITIC DISEASES

(*See also Numbers 636, 645, 651*)

653. *Etiology of Tsutsugamushi Disease.* NAOSUKE HAYASHI. J. Parasitol., Urbana, Ill., 1920, **7**, 53–68.

An endemic infectious disease of Northern Japan which is known as tsutsugamushi disease, has a close resemblance to Rocky Mountain spotted fever of this country. The invertebrate vector in both cases is an acarine, but while the spotted fever is transmitted by a tick, the Japanese disease is carried by a minute mite belonging to the same group as the so-called "chiggers" in this country. Dr. Hayashi has been working upon this disease since 1906 and in this paper not only summarizes what he has already published in Japanese medical journals, but adds new facts and conclusions.

In patients suffering from the disease minute bodies described as "rod" "spheroid" and "ring-shaped" have been found in the lymphocytes of lymph nodes and in mononuclear endothelial phagocytes of the spleen and lymph nodes and in the region of the bite. They also occur free in the blood plasma and in severe cases in the red cells.

The disease has been transmitted experimentally to monkeys, guinea pigs, rabbits and calves, and in these similar bodies have been demonstrated. The original bearer of the virus in infected regions is the field mouse on which the mite is parasitic.

The supposed causative organisms resemble bacteria but no evidence of their bacterial nature has been obtained. Cultural experiments have proved wholly negative.

It is believed to be a piroplasm closely allied to *Theileria parva*, and has been tentatively designated as *Theileria tsutsugamusha*. The author points out a very close similarity of this organism and the bodies found by Wolbach in spotted fever.—W. A. R.

654. *On the Classification of the Ascaridae. II. The Polydelphis Group; With Some Account of other Ascarids Parasitic in Snakes.* H. A. BAYLIS. Parasitology, Lond., 1920, **12**, 411–426.

The ascarids of snakes present considerable difficulties from the systematic point of view owing to the incomplete character of many of the descriptions, and confusion of nomenclature. They show remarkably few characters which can be regarded as of more than specific value. Most of them appear to fall into two well marked groups which are provisionally treated as genera.

The *Ophidascaris* group includes those in which the uterus is two-branched, vulva usually posterior, and rarely in front of the middle. There are more or less well-developed interlabia between the main lips, and usually the cuticle at the bases of the main lips is deeply grooved by an incision running in from the interlabium on either side.

The *Polydelphis* group consists of species in which the uterus breaks up into more than two (four or six) branches; vulva with few exceptions in front of middle of the body, and interlabia are absent.—W. A. R.

655. *The Life-Histories of Dictyocaulus filaria (Rud.) and Dictyocaulus viviparous* (Bloch). R. DAUBNEY. J. Comp. Path. & Therap., Edinb. & Lond., 1920, **33**, 1–266.

When conditions are suitable the eggs of *Dictyocaulus filaria* and *Dictyocaulus viviparus* hatch and liberate embryos which do not feed or grow but undergrow a moult in the course of 1 or 2 days, retaining the old cuticle. A second moult occurs in from 12 to 48 hours after the first. The skin of both moults is retained by the larvae. The casting of the first cuticle which completes the first moult occurs 12 to 48 hours after the second moult but the larvae retain the cuticle of the second moult.

The larvae of the final stage or those that have completed the first moult, migrate under favorable conditions of temperature and moisture on to upright objects such as walls of jars and blades of grass. These larvae possess a high degree of resistance to cold and drying but do not withstand extreme drying. Sheep may be infected with *Dictyocaulus filaria* by feeding the final-stage larvae. The larvae in all probability travel from the intestines to the lungs by way of the blood stream. The worms mature in about 6 weeks from the time of the infection. Infection of cattle with *Dictyocaulus viviparous* probably takes place in much the same way. The final-stage larvae of *Dictyocaulus filaria* do not appear to be able to penetrate the unbroken skin.—C. E. H.

656. *Observations on the Eggs of Dictyocaulus filaria.* HOWARD CRAWLEY. J. Am. Vet. M. Ass., Wash., 1921, **58**, 684–688.

The observations were based upon specimens of this worm taken from the lung of a sheep. Figures are presented and a detailed description of the ova given. The eggs of *Dictyocaulus filaria* average 125 microns long. They are symmetrical, the cross section being an ellipse and not a circle. The average diameter is 77 microns. The outline, viewed from one of the flat sides, is fundamentally elliptical.—W. A. B.

657. *On Some New Haemogregarines from British East Africa.* C. A. HOARE. Parasitology, Lond., 1920, **12**, 315–328.

From a series of 27 animals from British East Africa two different species of *Bufo* and two snakes proved to be infected with haemogregarines. These are described in some detail.

The author discusses the structure variously known as "the light area," "rim," "membrane," "cyst" and "capsule." He agrees with Woodcock (1912), that the empty space around the parasites is due to shrinkage, the parasites, however, being surrounded by a distinct thin sheath which envelops their body closely.—W. A. R.

658. On Some Digenetic Trematodes in Japan. HARUJIRO KOBAYASHI. Parasitology, Lond. 1920, **12**, 380–410.

This paper is based on an examination of a collection of Trematoda from various parts of Japan, including Formosa. Known species are discussed and 10 new species are described. Three of these are types of the new genera *Microtrema, Leptolecithum* and *Exorchis.*—W. A. R.

659. On the Migratory Course of Trichosomoides crassicauda (Bellingham) in the Body of the Final Host. SADAMU YOKOGAWA. J. Parasitol., Urbana, Ill., 1920, **7**, 80–84.

Trichosomoides crassicauda is a nematode belonging to the family *Trichinellidae,* which is found in the bladder of wild rats. A half-grown white rat was fed with many eggs of the worm, collected from the urine of infected rats. The next day it was fed 15 adult worms, and many eggs and on the third day it again was fed many eggs. The next day it was killed.

Larvae of the worm were found in the body cavity, pleural cavity, and lungs, suggesting that the larvae, like those of various ascarids recently studied, must pass to the lungs before they can establish themselves in their normal habitat.—W. A. R.

660. Acanthocephala Parasitic in the Dog. H. J. VAN CLEAVE. J. Parasitol., Urbana, Ill., 1920, **7**, 91–94.

There are few published records of the occurrence of *Acanthocephala* in dogs, and there exists considerable uncertainty regarding the indentification of the species encountered.

But one species has been recorded from dogs in North America. Originally placed by Kaupp in the genus *Echinorhynchus* it is now recognized as *Oncicola canis.* This larval form is carried by the armadillo and it seems probable that the adult is much more prevalent as a dog parasite in the southwest than published records would indicate.—W. A. R.

661. On a Remarkable New Species of Porocephalus (P. Pomeroyi, sp. n.) from the Fore-gut of a Nigerian Cobra. W. N. F. WOODLAND. Parasitology, Lond., 1920, **12**, 337–340.

Two linguatulids, belonging to the genus *Porocephalus* and apparently male and female of the same species were obtained from the fore-gut of a cobra, *Naia nigricollis.* They present the most marked sexual dimorphism yet discovered in the group, the female having 32 annuli and the male 37.

The author notes that the situation in the fore-gut is an unusual one, the vast majority of linguatulids being found either in the frontal sinuses, nasal cavity, trachea, lungs, or body cavity, or in the substance of certain organs (muscles, liver, kidney, spleen) of vertebrates other than fishes.—W. A. R.

TROPICAL DISEASES

(See also Numbers 685, 722, 729, 811, 812)

662. Notes on Blackwater Fever in Macedonia. J. F. GASKELL. Ann. Trop. M. & Parasitol., Liverp., 1920, **14**, 3–21.

The Serbian army became heavily infected with malaria at Salonika in 1916, and proper treatment could often not be given. During the autumn and winter of 1917–1918, 7 cases of blackwater fever came under the author's observation in the 41st General Hospital at Salonika. Except for a few cases in the early spring of 1917, blackwater fever did not appear until the autumn and winter of 1917–1918, when the army had passed through two severe malarial seasons, and most of the men were suffering from chronic malaria.

Benign tertian parasites, associated with definite attacks of malaria, were found in the blood of 4 of the blackwater fever cases, while in 3 of the cases no parasites were found, as the blood was not examined until after the onset of the fatal attack. No parasites were found in any of the cases after the blackwater fever had become established.

Six of the 7 cases occurred between October, 1917, and April, 1918. Thus, the disease occurred in winter, when, owing to cold, malarial relapses were common; the common history being a chill which brought on a malarial attack, with which the attack of blackwater fever was associated.

The seven cases had 12 attacks of blackwater fever; 8 occurring in the hospital and following rapidly upon the administration of quinine. The third attack in one case developed 6 days after the second attack, while the patient was taking quinine regularly; and this attack was so severe that the patient died before hemoglobin appeared in the urine.

In the routine treatment of malaria in the hospital, quinine was given in doses of 30 grains by mouth daily or 20 grains intramuscularly every morning and evening. From the onset of the attacks of blackwater fever, it appeared that each patient had a critical dose of quinine which brought on the attack (20 to 80 grains producing an attack of blackwater fever), and that smaller doses could be tolerated by him without ill effect. Thus, when 20 to 30 grains a day would bring on an attack of blackwater fever, it was found that 10 to 20 grains a day could be tolerated.

Continuation of quinine after the attack of blackwater fever had begun appeared to be most dangerous: in 5 cases where quinine was continued, suppression of urine developed and the illness was severe, being fatal in 4 of the 5 cases. In the 2 cases in which quinine was stopped as soon as blackwater fever developed, the condition cleared up quickly.

In some cases, the onset was marked by a rigor; in other cases the exact time of onset could not be determined. Vomiting was usually present; mental confusion and drowsiness became marked on the second day in severe cases; a rapidly increasing jaundice was present; with collapse and feeble rapid pulse in the severe cases.

Hemoglobin does not appear in the urine for a varying period after hemolysis begins: in one rapidly fatal case the hemoglobin was in the kidney tubules, but had not reached the urine. Excretion of hemoglobin in the urine does not last over a day or two—in one case 4 days; which indicates that the hemolysis is complete in a comparatively short time, even though the clinical condition remains severe, and regardless of whether quinine is continued or not. One case had a third attack 7 days after the onset of the second attack.

Excretion of albumin persisted, according to the severity of the attack, from 4 to 60 days.

The degree of suppression of urine varied from reduction of the amount to complete suppression, reaching its maximum about the fifth day, and gradually returning to normal about the fourteenth day.

The suppression is mechanical; the kidney tubules being obstructed by plugs of coarsely granular material, chiefly in the region of the loop of Henle: the first convoluted tubules above the point of obstruction are dilated, but the epithelium is well preserved.

The important thing in treatment is to keep the blood pressure up, to dilute the hemoglobin so as to prevent coagulation in the kidney tubules, and to dilute the toxins; this is accomplished by the administration of large amounts of fluid subcutaneously, by the rectum and by the mouth.

Quinine should be stopped as soon as blackwater fever develops; not only because it increases the toxic condition and increases the danger of suppression, but also because it is unnecessary as all malarial parasites in the circulation are destroyed by the attack of blackwater fever itself.

The condition is a sudden hemolysis in a case of chronic malaria, brought about by quinine; exposure to cold being usually a contributing factor. In any particular patient, malarial attacks can be treated by doses of quinine below the critical dose necessary to produce an attack of blackwater fever in that case.—E. R. W.

663. *Black Water Fever.* S. C. NAG. Indian M. Rec., Calcutta, 1920, **40**, 169–173.

This paper covers the clinical aspects of this disease.—C. P. B.

664. *Present Status of Plague, with Historical Review.* W. H. KELLOGG. Am. J. Pub. Health, Chicago, 1920, **10**, 835–844.

A review of the plague situation including an interesting controversy between the local and national health agencies and the state department. Plague is endemic among the ground squirrels of California and these must be eradicated if bubonic plague is to be overcome.—M. C. P.

MEDICAL ENTOMOLOGY

665. *The Relation of Insects to the Dissemination of Diseases.* EWEN MACKINNON. Sci. & Ind., Australia, 1920, **2**, 652–658.

The author has summarized the relations which insects may bear towards plant and animal diseases due to microorganisms as follows:

I. Mechanically carried (external transmission). The infective organism may be picked up by the insect on external parts of its body, e.g., legs, or outer mouth parts, where it may retain its virulence for some time.

(a) The organism may then be directly inoculated, as into wounds made by the insect carrier; or

(b) the organism may be accidentally sown from the insect's body under such conditions that infection follows.

II. Actively Carried (internal transmission). The microorganism may be taken up by an insect during feeding and passed along unharmed in the alimentary tract.

(c) If the infective principle is merely taken into the body, and without change or multiplication passed out in the normal way, we have mechanical internal transmission.

(d) If the infective principle develops or multiplies within the insect body, and finally reaches a part from which it may be successfully transferred to its alternate host, we have biological internal transmission.

III. Indirect association. An insect, though not itself carrying infection, may cause wounds, through which parasitic microorganisms brought there by other agencies, find easy access into the plant or animal body.

Each of the above headings is discussed in detail and examples given.—Z. N. W.

666. *The Egg Laying Habits of Californian Anophelines.* W. B. HERMS AND S. B. FREEBORN. J. Parasitol., Urbana, Ill., 1920, **7**, 69–79.

Observations were made on the egg-laying habits of *Anopheles quadrimaculatus* Say (=*A. occidentalis* D. & K.), *A. punctipennis* Say, and *A. pseudopunctipennis* Theobald. It was found that the eggs of the 3 species are readily separable by morphological characters.

The number of eggs deposited per laying was found to be greater than hitherto recorded, *A. quadrimaculatus* averaging 209 eggs and *A. punctipennis* 203 per laying. The experiments indicated slight variations in the incubation periods, that of *A. quadrimaculatus* being 2.5 days, *A. punctipennis* 3.2, and *A. pseudopunctipennis* 3 days.

It was found that the eggs of *A. quadrimaculatus* could withstand drying for 72 hours but that those of *A. punctipennis* failed to hatch after 24 hours of drying. The eggs in the first mentioned lot were subject to temperature ranging from 65°F. to 74°F.—W. A. R.

667. *Crab-holes, Trees, and Other Mosquito Sources in Lagos.* J. M. DALZIEL. Bull. Entomol. Research, Lond., 1920, **11**, 247–270.

Contrary to statements in American literature to the effect that crab hole mosquitoes do not molest man, the author finds in Lagos that of the 14 species bred from larvae from crab holes, 10 were known to attack man. Among these were the yellow fever mosquito and an anopheline.

Commencing in the rainy season of 1915 a regular search for breeding places in trees was carried out. Up to June, 1919, the total included 74 findings in 27 different species of trees. Twenty-eight per cent of the findings were of *Stegomyia fasciata*, a percentage which would be much increased if the rotting stumps of banana plants were included, as these are a most prolific source of the yellow fever mosquito in native compounds.

Other breeding places considered are wells, boats and canoes, agbo pots, roof gutters and various domestic sources. The total number of species collected in Lagos is 46 to which should be added 10 others previously reported.—W. A. R.

668. *The Larva and Breeding Places of Aedes aldrichi.* E. HEARLE. Canad. Entomol., Lond., Canada, 1921, **53**, 48.

Aedes aldrichi is the dominant mosquito in the lower Fraser Valley, B.C., and the main mosquito pest of that region. Its main breeding places are the wooded river bottoms, covered with cottonwood and a tangled growth of willow, rose, and spiraea. At freshet time these are converted into temporary swamps capable of producing enormous numbers of mosquitoes. The larva is described in detail.—W. A. R.

669. *On the Genus Phlebotomus.—Part IV.* R. NEWSTEAD. Bull Entomol. Research, Lond., 1920, **11**, 305–311.

Chiefly materials towards a study of the geographical distribution of the blood-sucking midges. A new species, *Phlebotomus signatipennis* from the Gold Coast is described and a detailed description of *P. sergenti*, Parrot, is given.—W. A. R.

670. *Insect Life on Sewage Filters.* W. H. PARKINSON AND H. D. BELL. Sanitary Publ. Co., Lond., 1919.

The presence of a Thysanuran, *Achorutes viaticus* (L). in large numbers in filters of the Sewage Disposal Works at Stratford-upon-Avon was found to be an important factor in maintaining efficient operation. Experimental work showed that they contributed to the production of ammonia and carbon-dioxide, either by passing air upwards through a liquid containing sewage as in the "activated sludge" process or by their action on growths deposited by tank effluent in sewage filters.

That the insects do attack and consume the colloidal growth in the filters was conclusively proved by experiments. Incidentally it is noted that *Achorutes* feed upon the larvae of *Psychoda*, a sewage fly which is a great nuisance on some filter beds on account of their enormous numbers.

The demonstration that of two filters which are otherwise exactly similar and operating under the same conditions a very great advantage is possessed by that which contains the *Achorutes*, led to successful attempts to introduce the insect into sewage disposal plants in other cities.

The characteristics and life history of *Achorutes* are briefly considered. Much of the text is devoted to details of the chemical tests of the effluent from experimental filters under identical conditions, except that to one the insects were added, whilst the other was worked without them.—W. A. R.

671. *Notes on Blood-sucking Flies in North Russia During the Summer of 1919.* A. D. FRASER. Bull. Entomol. Research, Lond., 1920, **11**, 195–197. With appendix by E. E. Austen, 197–198.

Records observations made in the vicinity of Obozerskaya, about 80 miles due south of Archangel, and on tours of inspection on the Vologda Front in late June and on the Seletskoe Front early in August.

Tabanidae were present in almost incredible numbers. The flies seemed quite as eager to attack human beings as animals, attacking in the forest in such numbers that work was almost impossible. Local inhabitants performed most of their outdoor work during the night and kept their cattle and other animals in sheds during the heat of the day.

Culicoides and *Simulium* were troublesome everywhere. *Phlebotomus* was not found and *Stomoxys* were rather exceptional until August, when they could be found in fair numbers.

The appendix lists 31 species of blood-sucking flies from North Russia, in the British Museum.—W. A. R.

672. *On the British Species of Simulium.—II. The Early Stages, with Corrections and Additions to Part I.* F. W. Edwards. Bull. Entomol. Research, Lond., 1920, **11**, 211–246.

The first part of this study, dealing with the adults, appeared in the Bulletin for 1915. The present paper presents the writer's observations on the biology of the insects, and characterizes for identification purposes, the larvae and pupae; adult males and females.

In the larvae the chief diagnostic characters are to be found in the number of joints in the antennae, the form of the anal gills, the markings of the head, and to some extent in the color of the body. The structure of the mentum and the number of hooks in the anal sucker also vary much with the different species. In the pupae the only characters of systematic value are the form of the cocoon and of the prothoracic respiratory filaments.—W. A. R.

673. *Leishmania, Herpetomonas, and Crithidia in Fleas.* Carlo Basile. Parasitology, Lond., 1920, **12**, 366–377.

In spite of the criticisms which his earlier researches on the transmission of visceral leishmaniasis by fleas encountered, the author's later work has confirmed his conclusions. The present paper points out the biological and morphological characteristics of the parasite in (a) the vertebrate host, (b) artificial cultures, and (c) the fleas *Ctenocephalus canis* and *Pulex irritans*.

The morphological study of the protozoa of herpetomonad and crithidial types discovered in fleas reveals characteristics which clearly differentiate them from the *Leishmania*. These distinctive characters are most evident in the flagellate stage, which are not only notably larger, but possess a pointed anterior end, in contrast to the rounded one of *Leishmania*.—W. A. R.

674. *The Capitulum of Psoroptes (Acarina).* P. A. Buxton. Parasitology, Lond., 1920, **12**, 334–336.

As none of the previously published figures or descriptions of the captilum and mouth parts of the psoroptic itch mite are complete, the author describes and presents 5 figures illustrating the structures. He found it impossible to observe the manner in which the organs are used by the living mites.—W. A. R.

PROTOZOOLOGY

675. *On the Morphology and Mitosis of Chilomastix mesnili (Wenyon), a Common Flagellate of the Human Intestine.* C. A. Kofoid and O. Swezy. Univ. Calif. Pub. Zool., Berkeley, 1920, **20**, 117–144.

Chilomastix mesnili was described by Wenyon in 1910, from the stools of a native of the Bahamas. Since that time it has been described from different parts of the world, generally in the tropics. It has been confused with other intestinal flagellates, especially with Trichomonas. Wenyon found it in a routine examination of stools; and it has generally been considered as non-pathogenic, but some observers are of the opinion that it may cause diarrhoea.

Kofoid and Swezy observed *Chilomastix mesnili* during the examination of the stools of soldiers, primarily for *Entamoeba histolytica*, and also during the examination of stools of persons at Berkeley. The examinations included stools from 2300 soldiers who had been over seas, mostly in France; 576 soldiers who had not been outside the United States; and 534 persons at Berkeley. Of the overseas group, 97, or 4.2 per cent; of the home group, 20, or 3.5 per cent; and of the California group, 28, or 5.3 per cent, were infeced with *Chilomastix mesnili*. From this work, it appears that *Chilomastix mesnili* is a fairly common parasite, and that it is not confined to the tropics.

Kofoid and Swezy studied the morphology and mitosis of the free and encysted stages of the organism in their material. The neuromotor system is complex, and consists of 4 granules (a centrosome and three blepharoplasts) each with two or more outgrowths, all connected in sequence on a fiber which has its origin in the central caryosome of the nucleus. The three anterior flagella (two left and one right) are free, and are about equal in length to the body, while the cytostomal flagellum or undulating membrane runs in the floor of the oral pouch within the cytoplasm to near the end of the cytostome.

The spiral groove, considered by previous workers as a twist of the body, is shown to be a permanent organ.

The active flagellate is 13 to 24 microns long, averaging 19.6: the stained flagellate is 9.6 to 15 microns long. The authors are not sure whether small forms, 3 microns long, are *Chilomastix*, though they are found with the larger forms.

The cysts are generally pyriform, are 6.5 to 9 microns long and 5.8 to 7.5 microns in diameter—that is, the size is very close to that of a red blood corpuscle. There is a local thickening of the cyst wall at the tip of the small end. There are granules of glycogen throughout the organism in the cyst, appearing as vacuoles in the stained preparation.

All of the organs except the free flagella are seen in the encysted organism: the spiral groove loses its spiral form and appears as a faint meridional shadow at the right of the cytostome.

Kofoid and Swezy have not found mitosis in the free flagellate; but they have found it in the encysted organism, and it is fully described. The nuclear membrane remains intact; the paradesmose—between the two daughter centrosomes—coming to lie on the nuclear membrane, with the centrosomes at the poles of the nucleus and directing the division of the nucleus.

The centrosomes, blepharoplasts and rhizoplasts are formed by division of the mother organs, while the other organs of the neuromotor system are formed by outgrowth from the newly formed centrosomes and blepharoplasts. Further nuclear divisions probably occur in the cysts, but the authors have not been able to find it.

The structure of *Chilomastix* is similar to that of the right cell in the binucleate Hexamitidae, especially to the cell on the right side of *Giardia*. The morphological relations of *Chilomastix* and *Giardia* are instructive as to the method by which bilaterality has appeared among the unicellular organisms.—E. R. W.

676. Endolimax kueneni n. sp., Parasitic in the Intestinal Tract of the Monkey Macacus cynomolgus. S. L. Brug. Parasitology, Lond., 1920, **12**, 378–379.

Motile amebae and cysts were found in the intestinal content. There was no ulceration of the mucosa, and blood and mucus were totally absent in the content.

Living cysts closely resembled iodine-cysts as described by Wenyon and O'Connor (1917). The stained cyst showed a characteristic sharply limited area, round or somewhat irregularly shaped, whose periphery stained more darkly than the surrounding protoplasm whilst the center stained like the protoplasm. This suffices to distinguish it from the human ameba.—W. A. R.

677. On the Cysts of a Hitherto Undescribed Species of Eimeria in Human Stools. E. P. Snijders. Parasitology, Lond., 1920, **12**, 427–432.

In the feces of a patient who had lived for 10 years in the tropics (Sumatra) and who had long suffered from amebic dysentery there suddenly appeared in the stools the oocysts of a coccidian. Subsequent repeated examinations of stools of this patient failed to reveal them.

The author carefully considers possible contamination, and accidental ingestion with food or drink and concludes that it is a case of real parasitism.

The organisms most closely resemble Dobell's *Eimeria oxyspora* but differ in that (1) the oocysts are larger, 45 μ instead of 36 μ; (2) the sporocysts are shorter, 17–20 μ as compared with 30–32 μ; (3) the outer layer of the walls of the oocysts and sporocysts is rather indistinct; (4) the sporocystic residua are much more evident, and on the contrary, an oocystic residuum seems to be almost absent; (5) Dobell's "cystalline" bodies between the nucleus and the posterior end of the sporozoites are absent.—W. A. R.

678. A Note on the New Species of Eimeria found in Man by Dr. E. P. Snijders. C. Dobell. Parasitology, Lond., 1920, **12**, 433–436.

An examination of a preparation sent by Dr. Snijders shows that the oocysts are of unusually large size and are certainly the largest described from man. The author adds some details to those given in Dr. Snijders' report, and describes the species as *Eimeria snijdersi*.—W. A. R.

679. Observations on the Intestinal Protozoa of Three Egyptian Lizards, with a Note on a Cell-invading Fungus. C. M. Wenyon. Parasitology, Lond., 1920, **12**, 350–365.

In the gut of *Chamaeleon vulgaris* was a flagellate of the leptomonas type, confined almost entirely to the cloaca though sometimes extending in small numbers into the rectum. In view of its occurrence in a vertebrate and its assumed relationship to some insect the author describes this species as *Leishmania chamaeleonis*.

In some of the chamaeleons there was present a fungus which definitely invaded the cells of the cloaca. The general characters are illustrated by drawings.

The lizards *Lacerta agilis* and *Agama stellio* harbored *Prowazekella lacertae*, *Chilomastix* sp., and *Entamoeba* sp. In addition, in *Agama stellio* were also found a trichomonas and a trichomastix, probably *Trichomonas lacertae* Prowazek and *Trichomastix lacertae* Bütschlii.

Broad questions of nomenclature are discussed at some length, the author enlarging upon his previously outlined views on the classification of the insect flagellates.—W. A. R.

680. Notes on Nosema apis Zander. R. Kudo. J. Parasitol., Urbana, Ill., 1920, **7**, 85–90.

Fresh spores of *Nosema apis* measure 4.6 to 6.4 μ long and from 2.5 to 3.4 μ broad and thick.

In spite of statements to the contrary the polar filament can easily be extruded, either by mechanical pressure or by the use of perhydrol. In the first method a very small drop of water emulsion of fresh spores is placed on a slide by means of a fine capillary tube, and is covered. Place the slide on a smooth and steady surface and cover the cover glass with a piece of cloth, over which the elbow is gently applied. Give a strong downward push to the arm and the polar filaments will be instantly extruded. The slide can best be examined under a dark field microscope. To make permanent preparations lift the cover carefully, fix in sublimate alcohol, and stain by Fontana's method.

The polar filament is 230 to 280 μ long. Extruded filaments show two parts, one with larger and the other with smaller undulations, each composed of 10–15 turns, indicating that the filament is doubly coiled. The structure of the spore is similar to that of *Thelohania magna*.—W. A. R.

681. *On some Filariid Parasites of Cattle and Other Ruminants.* C. L. Boulenger. Parasitology, Lond., 1920, **12**, 341–349.

From a considerable collection of filariid worms of ruminants 4 species were separated. These all belonged to the genus *Setaria* Viborg 1795. Two represent new species, *S. marshalli* from cattle at Wassein, Burma, and *S. hornbyi* from sable antelope, *Hippotragus niger*, of Northern Rhodesia.—W. A. R.

682. *Fish Myxosporidia from Plymouth.* J. S. Dunkerly. Parasitology, Lond., 1920, **12**, 328–333.

Out of 46 species of fish occurring at Plymouth 24 harbored myxosporidian parasites. Regarding possible new species a conservative attitude is shown. When a form was found to possess spores which agreed with the published description, the parasite has been given the name of the species described even though it occurred on a different host.

The following new species are described: *Ceratomyxa lata* from *Capros sanglier*, *Ceratomyxa dubia* from *Cottus bubalis*, *Myxidium intermedium* from *Pleuronectes flesus*, *Sphaeromyxa longa* from *Gadus minutus*, and *Sphaeromyxa ovata* from *Onos tricirratus*.—W. A. R.

EPIDEMIOLOGY

(*See also Numbers 665, 718, 753, 755*)

683. *Results of Vaccination in the Philippines.* Victor G. Heiser. Am. J. Pub. Health, Chicago, 1921, **11**, 142.

In Manila, population of over 250,000, not one death occurred in a period of 7 years. Between 1915 and 1919, when vaccination of newborn children and new arrivals in Manila was not effectively carried out, the disease reappeared and in the summer of 1918 more than 700 deaths from smallpox were reported in Manila alone.—M. C. P.

684. *Epidemiological Study of Smallpox in California.* J. N. Force. Am. J. Pub. Health, Chicago, 1921, **11**, 119–125.

A discussion of the existing law providing for compulsory vaccination of school children. Charts are given showing the age distribution of smallpox in California for the years 1916–19.—M. C. P.

685. *Methods of Plague Control.* F. Simpson. Am. J. Pub. Health, Chicago, 1920, **10**, 845–850.

Until 1903, when the relationship between the rat and the disease was officially recognized, there were no rational measures of control. In 1908 the Indian Plague Commission was able to establish the following: bubonic plague is primarily a disease of rodents, transported by the rat and transmitted by the flea, and that the disease is rarely transmitted in any other way. Hence, the control of the disease depends upon the elimination of rats and fleas on ships and on shore.—M. C. P.

686. *Diphtheria Carriers.* George H. Weaver. J. Am. M. Ass., Chicago, 1921, **76**, 831.

After diphtheria about one-half of the cases being very weak became negative during the following 7 days. Three weeks after the onset 71.2 per cent became negative. After 4 weeks 83.2 per cent were negative. After 7 weeks less than 1 per cent yielded positive cultures. Patients were released after 3 negative cultures were obtained, the cultures having been made at intervals of from 1 to 3 days from nose and throat. Of 52 carriers 55.8 per cent were free from bacilli after 2 weeks, 80.8 per cent after 4 weeks. In 10 the bacilli persisted longer than 4 weeks. In 4 of these, cultures were obtained from the pharynx only and the persistence was associated with abnormal tonsils with deep crypts and roughened surface. In nasal cases discharges were associated with enlarged adenoids and chronic rhinitis. The largest factor in the removal of diphtheria bacilli appears to be the destruction by leucocytes. The local use of diphtheria antitoxin and serum produced by immunizing with the bacterial bodies has not given satisfactory results. Carriers are cleaned up by the removal of local conditions favoring retention of bacilli and by the use of washes. Virulent diphtheria bacilli are present in the nose and throat of a considerable portion of healthy carriers and in larger proportion in those who have been in contact with cases of diphtheria.—P. G. H.

687. *Sanitary Conditions in Peru.* Henry Hanson. Am. J. Pub. Health, Chicago, 1921, **11**, 13–16.

Malaria, yellow fever, and bubonic plague are endemic in Peru and in some sections there is a great deal of tuberculosis. No practical sanitary work is carried on by purely Peruvian initiative and there are no cities with even a fairly good water and sewage system.—M. C. P.

688. *Sociological Background of Sanitary Work in Peru.* PHILIP A. MEANS. Am. J. Pub. Health, Chicago, 1921, **11**, 17–20.

No improvement of sanitary conditions can be expected until the land owning class assumes the proper attitude toward the responsibility of owning land with a large number of tenants living upon it.—M. C. P.

689. *Scarlet Fever and the Streptococcic Sore Throat: An Epidemiological Discussion.* A. J. WARING. South. M. J., Birmingham, 1921, **14**, 265–268.

In reporting the study of an outbreak of scarlet fever following an epidemic of septic sore throat, the author calls attention to the apparent causal relationship of the hemolytic streptococcus and recites the evidence which he believes proves the relationship.—J. H. B.

690. *The Significance of the Bacteria Found in the Throats of Healthy People.* ARTHUR L. BLOOMFIELD. Johns Hopkins Hosp. Bull., Balt., 1921, **32**, 33–37.

The author found that repeated cultures made from the throat of the healthy individual over a considerable length of time reveal two groups of organisms. The first is a group which is constantly found, apparently forming the true normal flora of the throat and which is composed of Gram-negative cocci and non-hemolytic streptococci. Besides this group many other bacteria may be found in throat cultures from normal people but they seem to be present only for a short time. Some of these—pneumococci and hemophilic bacteria—may be normal inhabitants but present in such small numbers as to be missed, although this seems unlikely. Bloomfield believes the idea that bacteria in general entering the upper air passages tend to colonize and live there indefinitely is erroneous. Indeed the normal surfaces of the upper respiratory tract offer a very unfavorable environment for foreign bacteria and special conditions—production of disease or of a focus of diseased tissue—are necessary to allow their prolonged or permanent presence.—F. W. H.

691. *Experimental Inoculation of Human Throats with Avirulent Diphtheria Bacilli.* W. L. MOSS, C. G. GUTHRIE AND B. C. MARSHALL. Johns Hopkins Hosp. Bull., Balt., 1921, **32**, 37–44.

As a result of their experiments the authors ascertained the following facts:

The carrier state was readily produced by inoculation of the throats of healthy individuals with avirulent diphtheria bacilli and lasted when thus produced for a long time. Subcutaneous administration of diphtheria antitoxin prior to inoculation of the throat did not prevent the induction of the carrier state. The implantation of avirulent diphtheria bacilli on the throats of human beings did not produce clinical diphtheria or any subjective or objective symptoms, so that these experiments offer confirmation of the guinea pig test for virulence. Also no one in contact with these "healthy carriers" of avirulent organisms developed clinical diphtheria. Prolonged residence in the human throat altered neither the morphology nor the staining and cultural characteristics of the bacilli, nor was there any increase in their virulence as the result of this type of animal passage. The carrier of avirulent diphtheria bacilli is thus not a menace to the community. The use of a spray of gentian violet in a strength which could be tolerated was apparently ineffectual in destroying these organisms.—F. W. H.

PUBLIC HEALTH REGULATION AND EDUCATION

692. *Sanitation in Venezuela and Columbia.* JACOB CRANE, JR. Am. J. Pub. Health, Chicago, 1921, **11**, 105–108.

The general impression of living conditions in these Carribean republics is one of dirt, bad odors, and ill health. With increasing education, better distribution of wealth, and economic improvement better conditions are to be expected.—M. C. P.

693. *Outbreak of Smallpox with Observations and Methods of Control.* LONSDALE J. ROPER. Am. J. Pub. Health, Chicago, 1921, **11**, 138–141.

A brief account of an outbreak of smallpox in the city of Portsmouth, Va., with the methods used to combat it.—M. C. P.

694. *Vaccination and the Student.* RAY L. WILBUR. Am. J. Pub. Health, Chicago, 1921, **11**, 126–127.

The greatest danger in public preventive medicine is that it works; hence people think that it is not necessary. The more effective public health measures are, the easier it is to oppose them, making them appear unnecessary. This is especially true of smallpox.—M. C. P.

695. *Medical and Anti-Medical Legislation in California.* CHESTER POWELL. Am. J. Pub. Health, Chicago, 1921, **11**, 128–132.

A discussion of the "anti-health" measure to be voted upon by the people of California in fall of 1921.—M. C. P.

696. *The Value of the Public Health Survey in the Public Health Campaign.* MURRAY P. HOWARD. Am. J. Pub. Health, Chicago, 1921, **11**, 113–117.

The benefits derived from a public health survey are largely dependent on the "follow-up."—M. C. P,

697. *The Hospital Betterment Movement in California.* W. E. Musgrave. Am. J. Pub. Health, Chicago, 1921, **11**, 208–211.

Hospitals have not progressed as rapidly as other branches of medicine and many do not meet even the minimum requirements. The Public Health League is trying to better conditions in California. The faults are in locations, fitness for purposes, organization, and financing.—M. C. P.

698. *What New York State Has Done in Health Centers.* B. R. Rickards. Am. J. Pub. Health, Chicago, 1921, **11**, 214–218.

A brief account of the development of health centers in New York State.—M. C. P.

699. *Present Status of Health Centers.* Walter H. Brown. Am. J. Pub. Health, Chicago, 1921, **11**, 218–220.

A discussion of the development of the Health Center and its status today.—M. C. P.

700. *Is the Health Center a Health Center? Need of a Positive Health Ideal in the Health Center.* Philip S. Platt. Am. J. Pub. Health, Chicago, 1921, **11**, 221–226.

There are 5 distinct types of Health Centers; (1) limited to education; (2) does the same as 1 and some medical treatment of the sick in addition; (3) a minature health department; (4) medical diagnosis of the most modern and scientific character; (5) emphasizes the desirability of good health by giving careful examinations to well people.—M. C. P.

701. *Baby Health Centers.* Lydia DeVilbiss. Am. J. Pub. Health, Chicago, 1921, **11**, 231–223.

An account of the personnel, location, equipment, and records required for a baby health center.—M. C. P.

702. *Relative Functions of Official and Non-official Health Agencies.* A Symposium. Am. J. Pub. Health, Chicago, 1920, **10**, 940–969.

The point of view of both the official and the non-official agency is given. The relation between official and non-official health agencies and the co-ordination of state and private enterprises in public health work are discussed.—M. C. P.

703. *Mother Craft Instruction for School Girls.* May Bliss Dickinson. Am. J. Pub. Health, Chicago, 1921, **11**, 199–202.

Simple hygiene and sanitation are taught. This instruction is carried home thus raising the standard of home health.—M. C. P.

INDUSTRIAL HYGIENE

704. *The Anthrax Problem in Horsehair.* Henry Field Smyth. J. Indust. Hyg., 1921, **2**, 11.

Samples of horsehair were collected in different industrial establishments, brought to the laboratory, covered with sterile nutrient bouillon, and incubated for 24 hours at 37°C. Then serial agar plates were poured and guinea pigs inoculated with 1 cc. of the culture In examining the plate cultures for anthrax colonies the technic of Hagan was followed. "Any colonies showing typical curling with long, regular, parallel threads usually returning to the colony mass, with few free ends visible, no spores in twenty-four hours, individual cells distinguishable with difficulty, and with no motility visible in any part of the colony, were transferred to agar and saved for further study." The author believes "that while Hagan's method will probably correctly exclude all organisms not giving typical colonies, yet it is merely an excellent method of exclusion and not a certain means of positive diagnosis." The animal inoculation method for the detection of anthrax bacilli is far more reliable. Anthrax bacilli were isolated from one out of four samples of Chinese hair examined. Experiments were carried out on the disinfection of hair and skins impregnated with anthrax bacilli. It was found that steam under pressure for at least 60 minutes at 15 pounds pressure or dry heat at 200°F. for at least 24 hours will kill anthrax spores, showing that the rules for the disinfection of hair as recommended by the Department of Agriculture, namely 200°F. for 15 minutes are not adequate.—D. H. B.

DISINFECTION AND GROWTH INHIBITION

(*See also Numbers 776, 786, 814*)

705. *The Heat Resistance of Spores with Special Reference to the Spores of B. botulinus.* H. Weiss. J. Infect. Dis., Chicago, 1921, **28**, 70–92.

Emulsions of the spores of *B. botulinus* in a medium composed of 2 parts of finely ground sheep brain in 1 part of water were exposed in 6 x ¾ inch tubes for varying periods of time in a DeKhotinsky oil bath at 95°C., 100°C., 105°C., and 120°C. The spores of 16 strains of *B. botulinus* were studied in this manner.

The spores of *B. botulinus* are destroyed within 5 hours at 100°C., within 40 minutes at 105°C., and within 6 minutes at 120°C. Bath temperatures are indicated.

The spores are killed gradually, suffering injury before their destruction. Spores 1 month old are three times as resistant as spores 5 months old. The more concentrated emulsions of spores resist higher temperatures than do less concentrated emulsions. Sodium chloride lowers the thermal resistance of the spores. The hydrogen ion concentration also has considerable influence on the thermal resistance of spores. In acid and alkaline media, of pH above or below 7.0, the resistance of spores to heat is greatly reduced.

The determination of the pH just before sterilization of canned foods and the allowance of a 50 per cent safety factor in the time of heating are recommended as precautions to be observed in all practical processing methods.—S. B-J.

706. *Theorie der Desinfektion.* (*Theory of Disinfection.*) J. Traube. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 286–302.

The important factors in the physical phases of the destruction of bacteria by certain substances are the ability of the substances to become concentrated on the surface of bacteria, the surface tension of the substances and the adsorption coefficients of the bacteria. Compounds of hydrocuprein were studied with a view to comparing their germicidal action with their physical properties and their adsorption by bacteria. By measurements with a "viscostagonometer" devised by the author, it was found that chininhydrochlorate, hydrochininhydrochlorate, and ethylhydrocupreinhydrochlorate have a high surface tension, in 1 per cent solution, equal almost to that of water. These are also the most active compounds of this series. The addition of alkali reduced their surface tension in 1 per cent solution, caused these solutions to become more turbid, and at the same time reduced their germicidal action. The bacteria most readily affected by these substances were nearly all Gram-positive. The gonococcus and meningococcus were the exceptions to this rule. It has been shown that the Gram-positive bacteria more readily adsorb dyes than do the Gram-negative microörganisms.

In agreement with the theoretical consideration, therefore, the disinfecting action of hydrocuprein and its compounds parallels the surface tension of these substances. An analogy is drawn between the sensitivity of Gram-positive bacteria as regards staining with basic dyes and their ability to adsorb hydrocuprein and certain of its compounds.—S. B-J.

707. *Über das Verhalten grampositiver und gramnegativer Bakterien zu den Halogenen.* (*The Susceptibility of Gram-positive and Gram-negative Bacteria to the Halogens.*) F. Breinl. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 343–348.

Various amounts of iodine in 1 cc. of distilled water were allowed to act on a drop of a thick suspension of bacteria in a physiological salt solution for 2 hours at room temperature. Then a loop was taken from each tube and plated on agar and growth noted after 24 hours. The result showed that the Gram-negative bacteria would withstand three times as much iodine as the Gram-positive varieties, with the exception of *B. cholerae*.

A similar susceptibility was shown by Gram-positive bacteria to chlorine and bromine.

The absorption of iodine by these bacteria was also tested. A loop of agar culture was emulsified in physiological salt solution and centrifuged to remove culture medium. The bacteria were then put in 2 cc. of the halogen solution and kept at room temperature for 2 hours, when the supernatant fluid was tested as in the first experiment for its inhibiting effect against the various organisms. It was found that the Gram-negative bacteria absorb more iodine than the Gram-positive.

Conclusion. Gram-negative bacteria show a high resistance and strong absorption power to the halogens, while Gram-positive bacteria absorb less and are more susceptible.—S. B-J.

WATER AND SEWAGE BACTERIOLOGY

(*See also Numbers 586, 591, 670, 721, 723, 724*)

708. *Le sterilisation de l'eau avec la teinture d'iode.* (*The Sterilization of Water with Tincture of Iodine.*) Batti. Rev. d'hyg., Par., 1919, **39**, 319–320.

A mixture of metallic iodine (5 grams), potassium iodide (2 grams) and ordinary alcohol (100 grams) is recommended for the rapid sterilization of water—5 drops of the above mixture to a liter. To the treated water well shaken, 5 drops of hyposulphite of sodium are added 20 minutes later to remove the yellow color and the taste of the iodine. Such treated water is ready for use immediately. Six drops of each of the two substances gave adequate treatment for the soldiers' canteens. The solutions keep indefinitely.—J. B.

709. *Appareil de javellisation automatique pour l'epuration des eaux de boisson.* (*Apparatus for Automatic Chlorine Treatment of Drinking Water.*) Cathoire. Rev. d'hyg., Par., 1919, **39**, 487–490.

A description of an automatic dropping apparatus which allows the mixture of Javelle water with a constant amount of water, preliminary to its transfer to a storage tank.—J. B.

710. *Boating and Fishing in Water-Supply Ponds.* X. H. Goodnough. Canad. Eng., Toronto, 1920, **39**, 416–417.

It is dangerous to allow boating or fishing in water-supply ponds as slight pollution may contaminate large reservoirs enough to cause a serious epidemic.—M. C. P.

711. *Sanitary Control of a Public Swimming Pool.* George Simons. Am. J. Pub. Health, Chicago, 1921, **11**, 234–238.

The swimming pool and its surroundings must be maintained in a sanitary fashion or become a public health risk. This paper discusses some of the problems and tells of the effort made to solve them in the maintenance of a pool in Florida.—M. C. P.

712. *Industrial Wastes in Relation to Water Supplies.* Wellington Donaldson. Am. J. Pub. Health, Chicago, 1921, **11**, 193–198.

The principal responsibility for preventing stream pollution by industrial wastes should be placed upon the plants themselves. Up-to-date purification plants should be used.—M. C. P.

FOOD BACTERIOLOGY

(*See also Numbers 592, 631, 705, 731*)

713. *Botulism.* Ernest C. Dickson. Am. J. Pub. Health, Chicago, 1920, **10**, 865–871.

Canned goods showing any signs of spoilage must be destroyed so that neither man nor animals can eat them; boiling destroys the toxin of botulinus.

There are two distinct strains, A and B, and specific antitoxins can be prepared for each. The serum must be used early, in sufficient quantities, and, either a polyvalent serum or a mixture of both types, must be administered if one is to obtain satisfactory results.—M. C. P.

714. *Suspected Food Poisoning.* Official Memorandum from Ministry of Health. Brit. Food J., Lond., 1920, **266**, 2–4.

Cases of food poisoning arise from two main causes: (1) The contamination of foods by inorganic poisons; (2) bacterial contamination.

Steps should at once be taken (1) to stop the sale of the food, and (2) to recover unconsumed portions of that which has already been sold.

When circumstances point to poisoning, not of bacterial origin, samples with all information available should be sent to a public analyst. It is of obvious advantage that arrangements for necessary bacteriological examinations should have been considered beforehand so that delay may be avoided. In addition to the examination of suspected food material a bacteriological examination should be made of materials from persons affected and particularly of the organs of fatal cases. In all cases the bacteriologist should be consulted as to the material required and the manner of its collection and transmission.—E. Le.

715. *Bacterial Groups in Decomposing Salmon.* Albert C. Hunter. J. Bact., Balt., 1920, **5**, 543–552.

Of 300 cultures isolated in a study of putrefaction of raw salmon all but 43 were eliminated either as duplicates or as not concerned with the destruction of salmon (i.e., did not produce indol, foul odors, or both, in a specially prepared fish broth). Of these 43, 21 cultures were identified as members of the colon-cloacae group; 1 resembled *Bact. alcaligenes*; 3 resembled *Bact. formosum*; 6 were pigment producers; 12 were not identified, but are considered as belonging to water and soil types. All of the 43 bacteria considered as playing significant parts in the decomposition were aerobic bacilli. No strict anaerobes and no spore-forming bacteria were isolated. The bacteria which decompose salmon are those which belong to the gill, mouth and skin flora of the fish, and belong to the types described in the literature as water, sewage and soil organisms.—I. S. F.

716. *Evaporation of Fruits and Vegetables.* W. V. Cruess. Am. J. Pub. Health, Chicago, 1921, **11**, 6–12.

The demand for dried fruits and vegetables has increased during the last few years. Evaporation is a comparatively new process while drying was practiced by the ancients. Evaporated products are more pleasing in appearance, in some cases of better texture and flavor but are more expensive than sun dried.—M. C. P.

717. *Examination of Frozen Egg Products and Interpretation of Results.* H. W. Redfield. U. S. Dept. Agric., Bulletin 846, 1920.

Methods are described for the bacteriological, chemical, physical, and microscopical examination of frozen egg products, and the results of the analysis of numerous samples are presented. It was found that analytical results for eggs of the same quality agreed very closely regardless of where they were produced and examined. A formula was devised which will separate into edible and inedible groups samples of liquid or frozen white, whole egg, yolky mixture and yolk prepared from either fresh or storage eggs.—S. H. A.

718. *Comparison of the Bacterial Counts from Machine and Hand Washed Dishes and Their Significance.* Roy S. Dearstyne. Am. J. Pub. Health, Chicago, 1920, **10**, 871–873.

In most restaurants and public eating places too little attention is given to washing, drying, and handling dishes and utensils. The numerical bacterial growth is much greater where the dishes are washed by the old hand method than where a dishwashing machine is used.—M. C. P.

719. *Maintaining Standards on Animal Foods.* M. E. Jaffa. Am. J. Pub. Health, Chicago, 1921, **11**, 23–24.
Any change of definition of A. F. C. O. which would tend to raise the standards should be encouraged while modifications which would, directly or indirectly, allow the marketing of a lower grade product should not be considered.—M. C. P.

HEALTH BOARD LABORATORY METHODS

(*See also Numbers 587, 590, 602, 604, 775*)

720. *Standardization of Laboratory Methods.* Augustus B. Wadsworth. Am. J. Pub. Health, Chicago, 1920, **10**, 933–935.
The urgent need for the standardization of laboratory methods is discussed. The steps taken by the state of New York are given briefly.—M. C. P.

721. *Bacteriological Methods of Water Analysis Used in the American Expeditionary Forces.* Edward Bartow and R. E. Greenfield. Am. J. Pub. Health, Chicago, 1921, **11**, 65–66.
Bacteriological methods and standards were adapted from Standard Methods of Water Analysis of the American Public Health Association and Medical War Manual No. 6.—M. C. P.

722. *Diagnosis and Detection of Rodent Plague.* C. L. Williams. Am. J. Pub. Health, Chicago, 1920, **10**, 851–864.
Details of diagnosis of plague, practical laboratory methods, and essential features of technique are given.—M. C. P.

723. *Notes on Bact. coli and Bact. aerogenes.* Max Levine. Am. J. Pub. Health, Chicago, 1921, **11**, 21–23.
Accurate information as to relative incidence of *B. coli* and *B. aerogenes* in nature would aid in the interpretation of the colon test in water analysis. Levine suggests the use of selective media for the isolation of these organisms.—M. C. P.

724. *Lactose Broth for Isolating Bacterium coli from Water.* Esther Wagner and W. F. Monfort. Am. J. Pub. Health, Chicago, 1921, **11**, 203–208.
Simplification of technic: (1) by reducing the lactose content; (2) by the addition of gentian violet; (3) pasteurization in place of autoclaving is suggested. The use of gentian violet insures cleaner endo plates and readier identification of colonies; also insures keeping qualities of broth.—M. C. P.

725. *Comparative Studies of Diphtheria Cultures on Loeffler's Medium with the Original Swabs Transported by Mail.* C. C. Young and Minna Crooks. Am. J. Pub. Health, Chicago, 1921, **11**, 241–244.
The diagnostic value of swabs and culture media for diphtheria is equal. However, other factors: (1) additional value of the swab for other infections, (2) no saving of time; (3) reduction of contaminated cultures and media; (4) practicability, and (5) saving of money as in the course of one year nearly one-half of swabs sent out were not returned (swabs are much cheaper than tubes of media) are in favor of continuing the use of swabs.—M. C. P.

CANCER RESEARCH

726. *Zur Strahlenbehandlung des Kehlkopf- und Rachenkarzinoms.* (*X-ray Treatment of Laryngeal and Pharyngeal Carcinoma.*) Karl Amersbach. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1269–1271.
Cure of these carcinomata by radiation alone has hitherto never been observed. Operative results in early pure laryngeal tumors are very favorable. Operations revealed that previous radio-therapy damaged the healthy tissues greatly and complicated the results of surgical treatment.—B. C.

727. *Primary Lymphosarcoma of the Stomach. A Report of Twelve Cases.* A. C. Broders and A. E. Mahle. J. Lab. & Clin. M., St. Louis, 1921, **6**, 249–252.
Broders and Mahle, after a brief analysis of the symptoms encountered in their cases, give the macroscopic and microscopic appearance of the neoplasms and the results of operation.—F. W. H.

728. *Due casi di sarcoma bilaterale primitivo dei reni di suino.* (*Two Cases of Primary Bilateral Sarcoma of the Kidneys in Swine.*) Giuleo Tesse. Clin. vet., Milano, 1921, **44**, 5–18.
The author describes two cases of primary bilateral sarcoma of the kidneys occurring in swine. In both cases the neoplasms were of the small, round celled variety. There is also an extensive general discussion of primary bilateral sarcoma occurring in man and in animals. —F. W. T.

DISEASES OF THE DIGESTIVE SYSTEM

(*See also Numbers 588, 727, 788, 805, 808, 811, 821*)

729. *Some Observations on Sprue and Its Prevalence in the South.* SIDNEY K. SIMON. South. M. J., Birmingham, 1921, **14**, 255–260.

A general descriptive article covering the clinical features, etiology and treatment. The author believes that the "*Monilia psilosis*" as described by Ashford is the etiologic factor and calls attention to the reports of cure following the use of vaccines made from these organisms.—J. H. B.

730. *The Isolation of B. dysenteriae (Flexner) from the Urine of an Infant with Dysentery.* CATHERINE CREIGHTON, C. E. WAGNER AND WILBURT C. DAVISON. Johns Hopkins Hosp. Bull., Balt., 1921, **32**, 50–51.

After a review of the literature the authors report the isolation of *B. dysenteriae* (Flexner) from the catheterized urine of a case of bacillary dysentery without any genito-urinary complications.—F. W. H.

731. *The Use of Fermented Milk and Milk Diets to Control Intestinal Putrefaction.* R. C. FISHER. Storrs (Conn.) Agr. Exp. Sta., Bull. 104, 1919, 153–175.

A somewhat more detailed account of work that appeared under the same title elsewhere and that has already been abstracted. (See Abstrs. Bact., 1920, **4**, No. 2011.)—R. S. B.

732. *Zur Pancreatitis acuta hemorrhagica mit Fettgewebsnekrose.* (*Acute Hemorrhagic Pancreatitis with Fat Necrosis.*) E. GLASS. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1254–1255.

Classification of diseases of the pancreas is not yet uniform from the pathological-anatomical and the surgical standpoints. In the cases observed the striking features were the rather early age (3d decade) of incidence and the absence of marked adiposity of those affected.—B. C.

DISEASES OF THE GENITO-URINARY SYSTEM

(*See also Numbers 588, 794, 795, 797, 798, 799, 800, 817, 819, 826, 827*)

733. *Ueber 'Parasyphilis'.* ("*Parasyphilis*".) CARL STERN. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1276–1278.

Clinical observations in many cases, two of which are cited, suggest the differentiation from true syphilis of those cases caused by other spirochetes (notably those of the mouth and those causing balanitis). This type of disease should be termed 'parasyphilis', and is different from syphilis because of the absence of *Spirocheta pallida* and because of a somewhat different clinical course. Animal experiments seem to support this view.—B. C.

734. *Weiterer Beitrag zur Frage der Goldsolreaktion im Liquor Sekundärsyphilitischer.* (*Further in Regard to the Goldsol Reaction in the Spinal Fluid of Secondary Syphilitics.*) J. KYRLE, R. BRANDT AND F. MRAS. Wein. klin. Wchnschr., 1920, **33**, 745–748.

In secondary syphilis, the goldsol reaction in the spinal fluid sometimes remains positive when other serologic tests have become negative. A series of 1000 tests indicates that such an outcome prognosticates danger of recidivation in the corresponding case.—B. C.

735. *Leptothrixangina mit akuter Glomerulonephritis.* (*Leptothrix Angina with Acute Glomerulonephritis.*) R. DEUSSING. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1278–1279.

An acute case of leptothrix angina is described, which later assumed a chronic form involving the kidneys. It is believed that the nephritis was due to secondary invaders and not to the leptothrix.—B. C.

DISEASES OF THE LOCOMOTOR SYSTEM

(*See also Number 816*)

736. *Bacteriologic Studies in Chronic Arthritis and Chorea.* J. H. RICHARDS. J. Bact., Balt., 1920, **5**, 511–525.

A study of 104 cases of chronic arthritis showed: *Streptococcus viridans* in the blood in 14 cases; chronic endocarditis in 11; acute rheumatic fever history in 12; history of chorea in 2; foci of *Str. viridans* infection in teeth 50 cases, in tonsils 40, ethmoid 5, frontal 0, sphenoid 2, antrum 4, prostate 2, pyelitis 1, and salpingitis 1; positive complement fixation with *Str. viridans* in 68 cases; *Str. viridans* in joint fluid cultures in 4 out of 54 cases; no foci of *Str. viridans* in 20 cases with 11 positive complement fixation tests. In addition, a streptococcus was seen in the Gram stain of the stools 9 times (not cultured successfully) and of these 7 gave positive complement fixation with *Str. viridans* antigen. Of 16 new cases of chorea, 4 showed no foci of *Str. viridans* infection. Complement fixation with *Str. viridans* antigen was positive in 13 and negative in 3; blood cultures positive in 5 and negative in 11 cases; feces positive in 3 cases. The tonsils 9 times, the teeth 8 times and the nose 5 times were found to be foci of *Str. viridans* infection.—I. S. F.

DISEASES OF THE NERVOUS SYSTEM

(*See also Number 809*)

737. *Rekonvaleszentenserum bei Encephalitis epidemica.* (*Convalescents' Serum in Epidemic Encephalitis.*) E. A. GRÜNEWALD. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1243–1244.

Intramuscular injection of the serum of convalescents from epidemic encephalitis results in a lytic reduction of fever and pulse rate within 3 days. The subicteric coloration also vanishes and the lethargy becomes less marked. In short, the acute symptoms quickly recede, the treatment depriving the disease of its alarming characters.—B. C.

738. *Ein eigenartiger Verlauf von Meningitis cerebrospinalis epidemica.* (*An Unusual Course of Epidemic Cerebrospinal Meningitis.*) EUGEN NETER. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1278.

A fatal case is described, the course of which was unusual because of the absence of the typical opisthotonos. Lumbar puncture gave a purulent fluid in which meningococci were demonstrated.—B. C.

739. *Zur Frage des Auftretens und der Behandlung akut entzündlicher Erweichungsherde im Gehirn nach Scharlach.* (*The Occurrence and Treatment of Acute Inflammatory Focal Encephalomalacia following Scarlet Fever.*) J. BUNGART. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1246–1247.

A severe case is reported in which the brain softening was not of ischemic origin but actually due to an inflammatory process. Trephination and drainage resulted in recovery.—B. C.

DISEASES OF THE RESPIRATORY SYSTEM (EXCEPT INFLUENZA AND TUBERCULOSIS)

(*See also Numbers 690, 691, 782, 825*)

740. *Microbal Studies on Acute Respiratory Infection with Especial Consideration of Immunological Types. Introduction.* W. H. PARK, A. W. WILLIAMS AND C. KRUMWIEDE. J. Immunol., Balt., 1921, **6**, 1–4.

An outline of the investigation and a brief discussion of some of the results obtained (for details, see succeeding papers). "The chief object of all these investigations is to demonstrate a common 'epidemic' or 'outbreak' strain among the groups of microbes claimed to have caused epidemics." The possibility that a common causative agent might fail to appear as the dominant type on the mucous surface is considered, but the emphasis is placed on such dominants. "The results of our studies indicate that of the different groups of microörganisms isolated by our procedure, all had the peculiarity that each group was an assemblage of many types. This was equally true for the pneumococcus, the influenza bacillus, the green-producing streptococci and the hemolytic streptococci. We obtained no evidence of the existence of a common filtrable organism."—L. A. K.

741. *Studies on Acute Respiratory Infections. I. Methods of Demonstrating Microörganisms, including "Filtrable Viruses" from Upper Respiratory Tract in "Health", in "Common Colds", and in "Influenza" with the Object of Discovering "Common Strains."* A. W. WILLIAMS, M. NEVIN AND C. R. GURLEY, assisted by A. MANN, H. HUSSEY AND F. BITTMAN. J. Immunol., Balt., 1921, **6**, 5–24.

A description of the methods employed and the frequency of various types of bacteria. Swabbings of the naso-pharynx showed a marked increase in growth in colds and influenza over normal controls, whereas those from the anterior nares were little increased. The most marked changes in the flora found were: (1) An increased incidence of "typical" (non-hemolytic) influenza bacilli in colds, and especially in influenza, (present in 92 per cent of influenza cases); (2) a parallel disappearance of Gram-negative cocci in colds and influenza; (3) the appearance of a peculiar green-producing streptococcus in influenza alone. The increased case-incidence of an organism usually paralleled its proportion to the total flora found. Attempts to demonstrate a filtrable organism with a Noguchi technique yielded 4 growths of a minute cocoid form from 10 influenza cases, which could not be cultivated beyond the first generation. From 7 early colds and 3 typical influenza cases, inoculation experiments in 45 human volunteers according to Foster's method were negative.—L. A. K.

742. *Studies on Acute Respiratory Infections. II. A Study of the Serological Relationships of Pneumococci from the Upper Respiratory Tract with Special Reference to Common Colds and Influenzal Conditions.* G. M. COOPER, L. MICHULOW AND N. E. BLANC. J. Immunol., Balt., 1921, **6**, 25–51.

Of 138 normal, colds, and influenza cases cultured from the naso-pharynx, pneumococci were found in 53. Forty-seven of these were grouped serologically, 9 falling in the fixed major groups. The others were tested in diluted group sera and in 22 monovalent rabbit sera using the absorption test as final criterion of identity. Six small groups and 13 unrelated strains were identified, besides 9 strains which could not be classified with the sera available. No single variety of pneumococcus was found dominant in either of the inflammatory conditions studied. The data do not indicate, therefore, a primary etiological rôle for this organism in colds or influenza.

In 25 cases in which several strains were isolated from the same individual, all from the case were similar in 24 instances, indicating the usual predominance of one variety in the naso-pharynx. All the isolated cocci but 2 fermented inulin, lactose, raffinose and sucrose promptly. The results with salicin and mannite were inconstant and without parallelism to serological findings.—L. A. K.

743. Studies on Acute Respiratory Infections. III. Relationship to Upper Respiratory Infections of Streptococci Producing a Green Zone on Standard Blood Agar Plates (Smith and Brown's Alpha Type). A. W. Williams, A. Unneberg, A. Goldman and H. Hussey. J. Immunol., Balt., 1921, **6**, 53–64.

The study of colony characteristics according to Brown with streptococci from 11 normal, 17 colds and 27 influenza cases gave results differing only slightly from Brown's. The chief distinguishing characteristic between alpha and beta types of hemolysis on Brown's standard agar plate is the zone of corpuscles immediately surrounding the colony, which may be a more constant test than tube hemolysis. "The only general statement we can make so far from this study is that in a series of influenza cases, cultures isolated from colonies of an apparently similar type belonging to the 'alpha streptococci' and appearing as dominants, show a multiplicity of strains as indicated by the reactions with carbohydrates and with a standard blood agar medium. Although these cultural reactions may not be as fixed as certain immunological reactions, it remains to be demonstrated that these cultural reactions can change in their passage from individual to individual throughout a single epidemic."—L. A. K.

744. Studies on Acute Respiratory Infection. IV. Further Studies on Grouping of Influenza Bacilli with Special Reference to Permanence of Type in the Carrier. O. R. Povitzky and H. T. Denny, assisted by D. J. Provost and A. C. LaMont. J. Immunol., Balt., 1921, **6**, 65–80.

One hundred strains in the 1918 pandemic and 90 from cases of 1920 were studied. Atypical hemoglobinophilic bacilli which hemolyzed horse blood plates and rabbit cells in the tube were isolated from 18 normal and colds cases. They did not produce indol and gave slight or no fermentation of glucose in 48 hours. By agglutinin absorption tests in 2 sera, two groups of 2 and 3 each were found; the others were not shown to be related.

With one serum, 4 out of 7 strains of influenzal meningitis were alike in agglutination and absorption; none of the remaining 3 were agglutinated or absorbed by agglutinins from a second serum save the homologous strain. These 7 strains all fermented glucose in 48 hours, and 5 (3 of the 4 serologically alike) formed indol.

With typical respiratory strains, 30 sera were prepared. Cross-agglutination was not infrequent. By agglutinin absorption, 3 strains were added to a group of 2 established by Valentine and Cooper in 1919. Of the rest, two groups of 2 and 3 each were found in a family of 5 simultaneously ill with influenza some members carrying both types. About 75 per cent of all typical strains examined formed indol; from 50 to 60 per cent fermented glucose, often feebly.

From a numbér of selected cases, many colonies were fished and tested serologically; in most cases they proved to be one type per case, but in a minority of instances, more than one type was present. "In carriers or where the infection was mild, more than one type variety of the influenza bacillus was apt to be found in the same case. In several convalescent carriers, tests were made during periods of from several weeks to three months. These resulted in finding in all but one, the original type of the influenza bacillus. In one case, tests made one year apart proved the original type present."—L. A. K.

745. Studies on Acute Respiratory Infection. V. Accidental Inoculation of Influenza Bacilli on the Mucous Membranes of Healthy Persons with Development of Infection in at least One. Persistence of Type Characteristics of the Bacilli. W. H. Park and G. Cooper. J. Immunol., Balt., 1921, **6**, 81–85.

Of 4 accidental inoculations with large quantities of freshly isolated strains of *B. influenzae*, two persons became ill on the 4th and 14th days, respectively. They and a third case who did not fall ill, carried for some time during their convalescence a single type of influenza bacillus in the naso-pharynx, which agglutinated and absorbed the serum of the inoculating strain. The fourth case developed neither symptoms nor the carrier state. "This is strong evidence that a strain responsible for an infection would reveal identical characteristics during infection and convalescence in the epidemic cases due to its invasion. If the epidemic of influenza was due to the Pfeiffer bacillus, we would expect the dominant strains to have similar type characteristics. The fact that just the opposite condition exists is strong proof against the primary etiological importance of the Pfeiffer bacillus in epidemic influenza."—L. A. K.

746. *Studies on Acute Respiratory Infection. VI. A Serological Study of the Bacillus of Pfeiffer.* A. F. Coca and M. F. Kelley. J. Immunol., Balt., 1921, 6, 87–101.

The etiological relation of the bacillus of Pfeiffer to influenza.

Eighteen cultures from cases of influenza in 1918, 1919 and 1920 were studied by agglutination and absorption in 8 monovalent rabbit sera. A group of 2 indentical strains found by Valentine and Cooper in 1919 was confirmed; irregularly occurring absorptive relationships were noted among 3 other cultures; all others were not shown to be related. "The foregoing study confirms the findings of Valentine and Cooper and supports the conclusion of Park that the bacillus of Pfeiffer can not be the cause of influenza."

2. One of the sera prepared to one of the three irregular strains was found to agglutinate heterologous but not the homologous strain. By the use of two other sera to this organism this phenomenon was shown to be due to specific inhibiting substances preventing clumping in quantities of 1/320 cc., while the organisms were completely agglutinated in the control tubes. Absorption with the homologous strain removed both heterologous and homologous agglutinins, and most of the inhibiting substance as tested with other sera. About the 40th day of the observation the inhibition began to disappear, and by the 50th complete agglutination was obtained with quantities from 2/10 to 1/1280 cc. These results are interpreted as due to the presence, with specific agglutinin, of an unusual quantity of specific inhibiting antibody.—L. A. K.

747. *Studies on Acute Respiratory Infection. VII. Report on the Prophylactic Vaccination of 1536 persons Against Acute Respiratory Diseases, 1919–1920.* A. I. Van Sholly and W. H. Park. J. Immunol., Balt., 1921, 6, 103–115.

The subjects were volunteers of both sexes and varying ages from the employees of the Metropolitan Life Insurance Company Home Office, in New York City; 3025 uninoculated controls were observed. Eighty-six per cent of these, and 87 per cent of the vaccinated remained under observation during the experiment, which lasted 6 months.

The larger number (1412) received a polyvalent saline vaccine containing, per cc., *B, influenzae,* 1000 millions, *S. hemolyticus,* 1000 millions, *S. viridans* 1000 millions, pneumococcus Type I, 2000 millions, pneumococcus Type II, 2000 millions, pneumococcus Type III, 1000 millions, sterilized by heat. 128 were given a vaccine of different composition, containing in addition *Staphylococcus aureus.* The dosage was 0.5, 1 and 1 cc. at weekly intervals. 1293 took three, 95, two and 148, one dose. About 25 per cent gave a general reaction, which was severe in about 3 per cent of total vaccinated. The severity of reaction bore no apparent relation to previous respiratory disease.

Of the inoculated, 13.7 per cent as against 29.77 per cent of the controls escaped respiratory infection during the period of observation. The incidence of grippe (1920) was about equal in both groups, but the inoculated cases had a shorter average absence from work than the controls. One case of pneumonia developed after 5 months in a vaccinated person, and 2 more after the period of observation had closed, a total of 3 against 12 for the controls. "From the examination of the foregoing statistics, we may draw contrary conclusions depending upon whichever part of the report we lay more stress. . . . . On the whole, balancing both sides, our evidence does not make a strong case in favor of the vaccines given by us as a prophylactic agent against acute respiratory diseases—pneumonia alone excepted. . . . It points to the importance of further research along this (vaccination with type pneumococci) line."—L. A. K.

748. *The Etiology of Acute Inflammation of the Nose, Pharynx and Tonsils.* Stuart Mudd, Samuel B. Grant and Alfred Goldman. J. Lab. & Clin. M., St. Louis, 1921, 6, 253–275.

The authors continue the report of their experimental studies of vasomotor reactions to chilling and also state the after-effects of the chilling experiments in one series and record the results of concurrent bacteriologic studies.—F. W. H.

749. *Localized Spontaneous Pyopneumothorax. Report of a Case with Roentgenographs.* Samuel Swezey and Maurice Levy. Am. Rev. Tuberc., Balt., 1921, 4, 896–907.

A case is reported of a pyogenic infection of the pleural cavity, illustrated by 7 roentgenographs.—T. G. H.

INFLUENZA

(*See also Number 813*)

750. *Studies of the Nasopharyngeal Secretions from Influenza Patients.* Peter K. Olitsky and Frederick L. Gates. J. Am. M. Ass., Chicago, 1921, 76, 640.

Nasopharyngeal washings were filtered and minute bodies cultivated from these washings. They are anaerobic, have a characteristic morphology, are filtrable and withstand glycerolation for a period of months. The effects on the blood and in the lungs of rabbits and guinea pigs when injected with these bodies are similar to those produced by the filtered and unfiltered nasopharyngeal secretions from early cases of epidemic influenza.—P. G. H.

751. Immunisierungsversuche mit Influenzabacillen. (*Immunization Experiments with Influenza Bacilli.*) R. Bieling and K. Joseph. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 228–248.

In this paper the authors report the experimental work upon which was based the preparation and testing of a polyvalent "grip serum," called "Hochst." This serum was used in the treatment of cases of influenza in several clinics with favorable results.

Horses and rabbits were immunized to several strains of *B. influenzae* by repeated intravenous injections. The sources of the strains are not stated, and no data are presented as to the amounts of bacterial emulsions from blood agar media used in the immunization of horses. The antigens used for the agglutination tests were emulsions of the bacilli from solid media made in 1 per cent formalin salt solution. High titers for agglutinins were produced in the animals. Some rabbits showed an agglutinin titer of 1:32000. The maximum titer of agglutinins from horses was 1:3200.

In these immune sera, other types of antibodies were demonstrable. Precipitins, complement-fixation substances, bacteriotropins and bactericidal substances were present in fairly high titer. Protection experiments were not done.

Some evidence is presented to prove similarity among various strains of influenza bacilli. Absorption of agglutinins was not studied, and it is not clearly stated that all the sera studied were monovalent. Six strains of *B. influenzae* were almost equally affected by the agglutinins, precipitins, bacteriotropins and complement-fixing substances in these various sera. On the basis of these data the authors conclude that these strains of Pfeiffer's bacillus are similar.—S. B-J.

752. Immunisierungsversuche mit Influenzabacillen. II. Mitteilung. (*Immunological Studies with Influenza Bacilli. II.*) R. Bieling. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 475–490.

Six strains of influenza bacilli were studied immunologically. The sources of these strains are not described in this paper. Rabbits were immunized to these strains and agglutination and absorption of agglutinin tests were made with the sera of the animals. Of these strains, one was found to be distinct, being agglutinated only by its homologous anti-serum, and failing to absorb agglutinins from any other serum. The other strains fell into two groups both by agglutination and absorption reactions. Heating the bacterial emulsions at 60°C. and 80°C. somewhat altered their reactions in the agglutination and absorption tests.

The work, however, definitely indicates group-relationships among the influenza bacilli.—S. B-J.

TUBERCULOSIS

(*See also Numbers 637, 823*)

753. Four Years of the Framingham Demonstration. D. B. Armstrong. Am. Rev. Tuberc., Balt., 1921, **4**, 908–919.

From progress so far certain conclusions may be arrived at. One per cent of the population has tuberculosis in an active form and another one per cent in an arrested form. About 9 or 10 cases to each death from the disease should be under treatment. Nurses, insurance agencies, etc., may aid extensively in locating cases but medical machinery is absolutely necessary in finding all cases of the disease. The medical machinery required is routine examination of the general population, routine medical work in schools and factories and expert consultation. At the beginning of the demonstration, 45 per cent of cases reported were in an early stage; after 4 years of work, 83 per cent of new cases reported were in an early stage. There should be at least one bed in an institution for every death from the disease. Thirty-three per cent of all cases should be given sanatorium or hospital treatment. A local community program calls for medical machinery, nursing machinery, institutional provision, an educational program, legislative provisions, general sanitation and proper organization. An educational program should teach people to fight tuberculous infection, to fight disease and finally to fight mortality. The irreducible minimum of early cases which escape detection seems to be about 14 per cent. In spite of all measures, 16 per cent of advanced cases will die from the disease. The cost of a complete tuberculosis program is about two dollars per capita per year. On the basis of the Framingham demonstration, 75,000 lives a year in the United States could be saved by the same measures.—T. G. H.

754. A Consolidated Medical Report Covering Discharges from Thirteen Minnesota County Sanatoria. Robinson Bosworth. Am. Rev. Tuberc., Balt., 1921, **5**, 66–73.

Among 402 sputum positive cases remaining 30 days or longer in the sanatoria, 186 died and in 93 the disease progressed. Many of these were far advanced cases. Many cases failed to remain as long as 30 days. On discharge 270 cases had positive sputum while 274 had negative sputum. Of those which had positive sputum at admission and negative on discharge there were 83 cases. Eleven cases had negative sputum on admission and positive on discharge. The number of cases with positive sputum restored to health compared with those so afflicted in and out of the sanatoria is so small as to have slight effect on the death rate. The problems to be solved are: (1) getting the case before the sputum becomes positive, and (2) proper control and supervision of the positive sputum cases after discharge.—T. G. H.

755. *A Resumé of a Tuberculous Survey of a Silk Mill Village in North Carolina.* L. B. McBrayer. Am. Rev. Tuberc., Balt., 1921, **4**, 920–925.

House infection, that is, the house being the medium of transmitting the infection of tuberculosis from one person to another, is not probable.

The infection of tuberculosis is not transmitted by casual exposure, but requires prolonged exposure and massive doses of the tubercle bacillus to produce serious infection.

One hundred per cent infection with the tubercle bacillus is a myth, and the probabilities are that the infection in the South, and particularly in North Carolina, is not likely more than 50 per cent and very probably much lower.—T. G. H.

756. *The Roentgenographic Pathology of Pulmonary Tuberculosis, including a Description of Tissue Changes as Revealed by Stereograms and a Critical Study of the Chemical Bearing of the Mutations of Destruction and Repair.* J. Burns Amberson. Am. Rev. Tuberc., Balt., 1921, **5**, 1–48.

In cases exhibiting roentgenoscopic evidence of progressive disease, 90 per cent or more will eventually exhibit ring shadows or areas of rarefaction to be interpreted as cavitation. In about half of the cases showing destruction coincident repair (fibrosis) could be demonstrated. In cases showing repair, clearing, clearing with fibrosis, and clearing with fibrosis and contraction of cavity were observed with about equal frequency. Fibrosis can be recognized about 6 months after clearing has started. Complete obliteration of cavitation occurred in a small number of cases and this usually required a longer time for accomplishment than any other manner of repair except calcification.

Repair is most likely to be initiated if cavitation does not exist. Of 100 cases, 62 showed cavitation and in 44 of these, contraction or obliteration of cavity occurred. In the 18 cases where no reduction of cavity occurred, 10 showed no evidence of fibrosis. The study indicates that most cases of moderately advanced disease will, under sanatorium care, display roentgenoscopic evidence of progressive repair while a majority of far advanced cases will show the reverse.

In cases showing local destructive changes, the constitutional condition in 90 per cent will remain stationary or become worse. Many patients will gain weight in spite of roentgenoscopic evidence of progressive disease and body nutrition is not a dependable index of the changes in the pulmonary lesion (unless there is a progressive loss of weight).

In most cases exhibiting destructive alterations, the average daily sputum weight will increase, while in those showing reparative changes it will decrease. Most cases exhibiting destructive changes (82 per cent) will have sputums persistently positive for tubercle bacilli. In 51 cases sputums, positive for tubercle bacilli, became negative during the period of repair, while in 39 cases, the sputum was positive throughout the period of observation. In 10 cases, only one of which showed cavity, the sputum was persistently negative for acid fast organisms. In this study 95 per cent of the cases showing progressive destruction sooner or later had bacilli-positive sputums, while 61 per cent of the repair group sooner or later had negative sputums. In all cases where complete obliteration of cavitation was observed the constitutional condition improved, body weight was gained, the average daily sputum weight decreased, and the sputum became negative for tubercle bacilli.—T. G. H.

757. *The Tonsillar Route of Infection in Pulmonary Tuberculosis.* James Genet Van Zwaluwenberg and G. P. Grabfield. Am. Rev. Tuberc., Balt., 1921, **5**, 57–65.

To study the shadow often seen at the apex of the lung, consecutive sets of plates on the same individuals over a period of time were examined. This shadow, the authors believe, represents a thickening of the pleura and is related to tonsillar and cervical gland tuberculosis. Such apical pleuritis is seen in at least 10 per cent of all X-ray examinations made, occurring most frequently in cases showing tuberculosis deposits in the faucial tonsils (93 per cent).

With the cervical gland tuberculosis this lesion is recognizable in 59 per cent of all cases and probably occurs in a larger number, being obscured by the shadows of pulmonary tuberculosis, 71 per cent in this group showing either this lesion or frank tuberculosis of the lung or both.

Cases without tuberculosis of the tonsil show an apical pleuritis in only 11 per cent of the cases.

It is suggested that a common route of infection may lie through the tonsil and cervical lymphatics to the apical pleura and thence into the lung. If this hypothesis is accepted it offers a singularly satisfactory explanation for the frequency of apical lesions, the predominance of lesions on the right side, of the pathogenesis of tuberculous pleurisy with effusion and other obscure features of this infection.—T. G. H.

758. *Les enseignements cliniques tirés de la guerre par la phtisiologie.* (*Clinical Lessons Drawn from the War in Tuberculosis.*) Émile Sergent. Rev. de la tuberculose, Par., 3rd Ser., 1920, **1**, 89–122.

The world war added much to the knowledge of tuberculosis in two ways: (1) the abundance of material, and (2) the conditions of examinations in the clinical centers and tirages. The author examined in 4 years more than 25,000 cases. The fact was also emphasized that diagnosis rested not on any single test but upon the interpretation of the sum of all examinations,—physical, X-ray and sputum. Ideas held before the war have been modified and revised concerning the symptomatology and diagnosis of pulmonary tuberculosis. The examination of the sputum for tubercle bacilli, albumen, etc. are not final tests. The location of infection in the lungs should be studied with the greatest care, as apical, basal, etc.; likewise, ideas concerning certain points in the etiology and pathogenicity of the disease have been modified since before the war. Tuberculosis is much more common than supposed, and the disease may "light up" in the adult. On the other hand, in men who had been wounded in the chest, no increase in the disease was noted.—T. G. H.

759. Le tubercle d'inoculation pulmonaire infantile et son evolution. (*The Tubercle of Infant Pulmonary Infection and its Evolution.*) L. Ribadeau-Dumas. Rev. de la tuberculose, Par., 3rd Ser., 1920, 1, 27–35.

Practically all tuberculosis can be traced to infection in infancy. The lesions produced in the infant are gelatinous, tuberculous infiltration, yellow tuberculous infiltration, the various types of pneumonia and white tuberculous infiltration.

The tuberculous nodule represents the usual form of initial lesion. Encysting and calcification begin early as shown by the following table:

Anatomic state of pulmonary nodules

YEAR OF AGE	PROGRESSIVE TUBERCULOSIS	WITH SIGNS OF HEALING	HEALED
1	47 cases 94%	3 cases 6%	0 cases 0%
2–5	35 cases 70%	8 cases 16%	7 cases 14%
4–7	12 cases 30%	14 cases 35%	14 cases 35%
8–14	6 cases 20%	3 cases 10%	21 cases 70%

—T. G. H.

760. Les modes d'infection et les modes de préservation de la tuberculose chez les enfants du premiere âge. (*The Modes of Infection and the Modes of Prevention of Tuberculosis in Infants.*) L. Bernard and R. Debré. Bull. Acad. de méd., Par., 1920, **84**, 86–93.

Most of the tuberculous children under one year of age have been infected by their parents. After infection separation from the mother frequently saves the life of the child.—G. H. R.

761. Tuberculosis from the Standpoint of the Postmortem. H. E. Robertson. Am. Rev. Tuberc., Balt., 1921, **4**, 882–888.

Nearly 50 per cent of all people of all ages show foci of tuberculosis; while of the remaining 50 per cent, fully one-half, at some period in life have been menaced by tuberculosis. The most common lesion found is an old healed pleuritis with or without fibrous adhesions, with old healed miliary tuberculosis of the lungs, spleen and liver coming next, and varying amounts of outspoken lung tuberculosis at the right apex and infections of the genito-urinary tract, lymph nodes, bones and joints, meninges, etc.

Almost any sort of lesion may mark the presence of tuberculosis. Four factors are to be dealt with: resistance of the individual, locality of tissue invaded, virulence of the organism and dosage of the organism. Five types of reaction are described which occur between the host and the tubercle bacillus, showing a decreasing scale of virulence. The author draws attention to the fact that once a person is infected with tuberculosis, he can never be positively assured of absolute freedom from its recurrence.—T. G. H.

762. The Absorption of Acacia from the Pleural Cavity of Normal and Tuberculous Rabbits. H. J. Corper and O. B. Rensch. Am. Rev. Tuberc., Balt., 1921, **5**, 49–56.

"With the means applied in this study there was found to be no difference in the absorption of 7 per cent acacia in saline solution, without or containing a suspension of virulent human tubercle bacilli, after intrapleural injection in rabbits both normal or previously sensitized by the subcutaneous or intravenous injection of the same culture of virulent human tubercle bacilli.

"This tends to corroborate the previous observation that there is no greater tendency towards the formation of a pleural effusion following the intrapleural injection of a suspension of tubercle bacilli in rabbits which have been previously sensitized with the same culture of bacilli.

"There is no evidence in our experiments to prove that in the rabbit tuberculous pleural effusions or empyemas were more prone to form in animals previously sensitized with the same culture of living virulent human tubercle bacilli than in those animals which did not receive a sensitizing injection.

"These and previously reported observations do not agree with those of Paterson concerning tuberculous pleural effusions in the rabbit. It is possible that a different reaction may occur in the guinea pig, in view of the generally accepted greater susceptibility of this animal to the allergic reaction. Final judgment on this subject should be reserved pending further observation."—T. G. H.

763. *Pleural Infection Complicating Artificial Pneumothorax Treated with Gentian Violet. A Preliminary Report.* Bertram H. Waters. Am. Rev. Tuberc., Balt., 1921, **4**, 875–881.

Two cases are reported which developed pleural infections with pyogenic organisms after artificial pneumothorax. These were treated with gentian violet 1:5000 with complete success. No effect upon the tubercle bacillus was noted.—T. G. H.

764. *Les bronchites tuberculeuses.* (*Tuberculous Bronchitis.*) F. Dumarest and H. Marotte. Rev. de la tuberculose, Par., 3rd Ser., 1920, **1**, 123–142.

The following forms of tuberculosis are discussed at length:

Five forms of parenchymatous tuberculosis: diffuse tuberculosis; nodular fibrous tuberculosis; fibro-caseous, uni-or bi-lateral tuberculosis; caseous, or extensive ulcerative tuberculosis or broncho-pneumonia.

Two forms of bronchial tuberculosis: bronchitis of the tuberculous and hereditary tuberculous with sclerosis and emphysema; tuberculosis of bronchial and benign forms.

Two forms of pleural tuberculosis: pleural tuberculosis; pleuro-pulmonary, pneumonia, cortical tuberculosis.—T. G. H.

765. *Le valeur de l'auscultation pour le dépistage précoce de la tuberculose pulmonaire chronique de l'adulte.* (*The Value of Auscultation in early Diagnosis of Chronic Pulmonary Tuberculosis in the Adult.*) Fernand Bezançon. Rev. de la tuberculose, Par., 3rd Ser., 1920, **1**, 1–19.

The physician will make note of abnormal respirations, permanent and localized, (which are not to be confounded with insufficient respirations of persons who do not know how to breathe), and which have a relation to faulty conformation of the thorax. Such abnormal respirations are not inevitably connected with a parenchymatous lesion of the lung, but can be associated with a functional respiratory trouble or a lesion of the naso-pharynx. When there are no general symptoms to guide the diagnostician as to whether the lesion is latent or active, other methods must be used, as examination of the sputum. Concentration tests on the sputum for tubercle bacilli should be made before a negative report is given. The stethoscopic findings should be controlled by X-ray pictures.—T. G. H.

766. *Mort subite chez un tuberculeux pulmonaire par lesion congestive diffuse et hemorragique du poumon (superinfection pulmonaire et allergie tuberculeuse).* (*Sudden Death in Pulmonary Tuberculosis by Diffuse and Hemorrhagic Congestion of the Lung.*) Fernand Bezançon, de Serbonnes and Krebs. Rev. de la tuberculose, Par., 3rd Ser., 1920, **1**, 39–42. A description of aca se is given with clinical and autopsy notes. Similar results can be obtained in the tuberculous guinea pig by tracheal injections.—T. G. H.

767. *Bemerkungen zu Friedmanns Vortrag "Die Friedmannsche Therapie und Prophylaxe der menschlichen und tierischen Tuberkulose."* (*Remarks upon Friedmann's Lecture: "The Friedmann Therapy and Prophylaxis of Human and Animal Tuberculosis."*) Bruno Lange. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1280.

Friedmann's turtle tubercle bacillus is identical culturally and immunologically with other acid-fast saprophytes found in water and soil. There is no evidence to suggest that the Friedmann bacillus possesses any unique properties that would make it especially efficacious in the treatment of tuberculosis in man.—B. C.

768. *Zur Beurteilung von Heilerfolgen bei Lungentuberkulose.* (*Judgment as to Cure in Pulmonary Tuberculosis.*) Hermann Zondek. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1271.

Three cases in adults are described in which x-rays as well as symptoms indicated undoubted tuberculosis. They were re-examined a year or more later and the symptoms and signs were all absent. Pulmonary tuberculosis not only heals spontaneously, but the Röntgen picture also recedes to normality. These observations show how extremely difficult it is sometimes to judge the effect of specific therapy.—B. C.

769. *Une epréuve de guérison de la tuberculose pulmonaire.* (*The Proof of Recovery from Pulmonary Tuberculosis.*) M. Louis Renon. Rev. de la tuberculose, Par., 3rd Ser., 1920, **1**, 20–26.

The proof of recovery from tuberculosis rests on stethoscopic findings of the chest, sputum examinations for tubercle bacilli both microscopically and by guinea pig inoculation, sputum examination for albumin, the tuberculin skin reaction, the complement fixation test and the X-ray examinations. When these tests are favorable for a period of 2 to 5 months the patient is well on the road to recovery and may start light work. The most favorable period for the patient is the fall months, the least favorable, the spring months.—T. G. H.

770. *Bacillotuberculose aiguë prolongée sans localisation.* (*Prolonged Acute Bacillary Tuberculosis without Localization.*) Gougerot, Guillain and Lemaire. Rev. de la tuberculose, Par., 3rd Ser., 1920, **1**, 56–59.

A case report is given of a man contracting tuberculosis and showing septicemia without a localization of the organisms.—T. G. H.

771. *Die Muskelmechanischen Momente bei der konstitutionellen Disposition zur Lungentuberkulose.* (*Musculo-mechanical Factors in Constitutional Disposition toward Pulmonary Tuberculosis.*) G. Ichok. Deutsche med. Wchnschr., 1920, **46**, 1252–1254.

The reduced musculo-mechanical effect of the upper extremities upon the thorax, in conjunction with asthenic constitutional anomalies, with characteristic muscle weakness and hypotonia are of great significance in the disposition to pulmonary tuberculosis. They favor improper expiration which leads to poor circulation in some lung areas and consequent reduction in resistance to the infection.—B. C.

772. *De la tuberculose pleuro-pulmonaire des noirs.* (*Pleuro-pulmonary Tuberculosis of the Negro.*) Ch. Broquet and L. Morenas. Rev. de la tuberculose, Par., 3rd Ser., 1920, **1**, 143–170.

The account deals with tuberculosis among the colonial troops in the French army, principally the Arabs, the Annamites and the Senegalese. Clinical notes, autopsy reports and diagnosis are considered at length. These troops have a low rate of tuberculosis in their home country, but in France in contact with whites, the rate runs as high as 20 to 30 per cent. —T. G. H.

773. *Recherches sur la valeur comparée de la reaction de fixation partiquée au moyen de l'antigène Calmette-Massol et l'antigène Besredka.* (*Researches upon the Comparative Value of the Fixation Reaction Practiced by Means of the Antigens of Calmette-Massol and of Besredka.*) F. Bezançon, Cohendy and Moreau. Rev. de la tuberculose, Par., 3rd Ser., 1920, **1**, 42–45.

The antigen of Calmette and Massol is made by extracting 5 gms. of tubercle bacilli in 100 cc. of 10 per cent Witte peptone solution 48 hours in a water bath at 65°C. After filtering it is ready for use. From 22 cases of tuberculosis the antigen of Besredka gave negative results in 17 instances. The antigen of Calmette-Massol was positive 11 times as were the other findings for tuberculosis; negative 4 times among which were 3 cases of asthma and in the other 7 instances the various laboratory and clinical findings did not agree. The latter antigen is considered the more sensitive.—T. G. H.

774. *L'adéno-cutiréaction à la tuberculine.* (*The Gland-Skin Reaction of Tuberculin.*) Germain Blechmann. Rev. de la tuberculose, Par., 3rd Ser., 1920, **1**, 45–52.

At times the von Pirquet test is negative in manifest cases of tuberculosis. Often in such instances a general ganglionic enlargement follows, with elevation of temperature and cough. The enlargement follows in 56 per cent of cases which have a positive von Pirquet and in 16 per cent of those which show a negative von Pirquet.—T. G. H.

775. *Studies on the Albumen Reaction in Sputum.* Ward Burdick and Harry Ganos. Am. Rev. Tuberc., Balt., 1921, **4**, 889–895.

Sputum (from 200 patients in various stages of tuberculosis) was examined by Esbach's method for albumin. Albumin was found in 95 per cent of patients with incipient pulmonary tuberculosis, 98 per cent of those with moderately advanced pulmonary tuberculosis, 92 per cent of those with advanced tuberculosis, and 100 per cent of unclassified cases of pulmonary tuberculosis. In 6 cases of chronic bronchitis and 2 of asthma no albumin was found, but it was present in the one case of lobar pneumonia studied. Sputums studied over a period of 3 days gave consistent qualitative results, but the amount of albumin present varied from day to day.—T. G. H.

776. *Practical Disinfection of Tuberculous Sputum.* Wm. R. Stokes. Am. J. Pub. Health, Chicago, 1920, **10**, 973–975.

The use of a 1 per cent solution of disinfectant No. 1; 40 per cent oxidized hydrocarbons from tar, 30 per cent neutral hydrocarbons from tar, and 30 per cent of a saponifier; or No. 2; phenols, cresols, and others of the series occurring in coal tar, in solution with soap, will destroy the tubercle bacillus in sputum if the disinfectant contains 1 per cent of caustic soda.—M. C. P.

DISEASES OF CHILDREN

(*See also Numbers 620, 689, 725, 730, 760, 810*)

777. *Etude de l'immunité diphtérique par l'intradermo-réaction à la toxine diphtérique.* (*Technique de Schick, Park et Zingher.*) *Ses applications á la prophlaxie scolaire de la diphtérie.* (*A Study of Diphtheria Immunity by the Schick Reaction. Its Application to the Prophylaxis of Diphtheria in Schools.*) P.-F. Armand-Delille and Pierre-Louis Marie. Bull. Acad. de méd., Par., 1920, **83**, 530–532.

The authors find the reaction is of great value in the control of epidemics in schools.—G. H. R.

778. *Mastoiditis in Children.* F. Krauss. Penna. M. J., 1920, **24**, 147–151.

A general paper. In the discussion Ersner reports bacteriological studies. Streptococci were found most frequently, then pneumococci. However, cases occurred in which staphylococci, diphtheroids, *B. coli* and Friedländer bacillus were isolated. Vaccine treatment is mentioned with favor.—C. P. B.

DERMATOLOGY

(*See also Numbers 684, 693, 817*)

779. *The Etiology of Common Warts.* Lyle B. Kingery. J. Am. M. Ass., Chicago, 1921, **76**, 440.

"The demonstration of a filtrable virus for warts by Wile and Kingery is further substantiated by their production in the second generation. The period of incubation from the time of inoculation to the development of well defined lesions is apparently much longer than pertains to other filtrable viruses."—P. G. H.

OPHTHALMOLOGY

(*See Number 806*)

ORAL BACTERIOLOGY

(*See also Number 736*)

780. *Rôle of Dentistry in Personal Hygiene.* Guy S. Mullberry. Am. J. Pub. Health, Chicago, 1921, **11**, 53–54.

The rôle of dentistry in personal hygiene is important both to the individual and to the public. Dental diseases are preventable in direct ratio to the knowledge of their causes which people possess and of the measure for prevention. The most suitable place for instruction in methods of prevention is in the public school and instruction should be by people specially trained for this work.—M. C. P.

731. *Contribution a l'étude bactériologique de la langue noire pileuse.* (*A Contribution to the Study of the Condition Known as "Black Hairy Tongue".*) A. Sartory. Bull. Acad. de méd., Par., 1920, **83**, 532–533.

The author found an organism, *Oospora lingualis*, in 4 cases of this disease.—G. H. R.

FILTERABLE VIRUSES

(*See Numbers 809, 824*)

SURGICAL BACTERIOLOGY

782. *Ein Fall von Anaeröben-Infektion nach Lungenschuss.* (*Anaerobe Infection Following Gunshot Wound in the Chest.*) Leopold Schönbauer. Wien. klin. Wchnschr., 1920, **33**, 706–707.

A gunshot wound in the chest produced a hemothorax which quickly became infected with an anaerobic bacillus of the Fraenkel type, in addition to aerobic forms. Lung infections with anaerobes are considered very rare occurrences.—B. C.

SEROLOGY

(*See also Numbers 612, 634, 734, 752, 773*)

783. *Über den Gehalt des menschlichen Blutserums an Komplement und Normalambozeptor für Hammelbultkorperchen.* (*On the Content of Complement and Normal Amboceptor for Sheep's Corpuscles in Human Blood Serum.*) K. Cori und G. Radnitz. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 445–462.

The average of 52 titrations of complement in human serum showed that 0.06 cc. was capable of hemolyzing 0.5 cc. of 10 per cent sheep corpuscles which had been sensitized with 3 units of amboceptor. The average value for the normal antisheep amboceptor was found to be 0.03 cc. of human serum, in titrations with 0.25 cc. of 10 per cent sheep's corpuscles and 0.025 cc. of fresh guinea pig serum as complement.

Among 16 patients with fever due to various causes, 10 showed unusually high values in the complement titrations. Extirpation of the spleen did not hinder the appearance of increased complement in the serum of patients with fever. No prognostic significance can be attached to the results of complement titrations in infectious diseases. Myeloid leukemia showed after roentgenization a decrease of complement and natural amboceptor. In syphilis, the complement content of the serum is low. No relationship was discoverable between the protein content of the serum and its complement and amboceptor values.—S. B-J.

784. *Über das Verhalten der Antikörper des Normalserums bei taglich widerholter Blutentziehung.* (*The Effect of Daily Bleedings upon the Antibody Content of Normal Serum.*) M. Hahn and H. Neu. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 349–356.

Twenty cc. of blood were withdrawn daily from rabbits 8 to 11 times and the bactericidal power of the serum tested after each bleeding. Repeated bleedings increased the bactericidal action of normal rabbit serum for *B. typhosus* and staphylococcus. The increased bactericidal substances were thermostabile, as they were not inactivated by heating the serum to 56°C. for 1 hour.

The titer of normal hemolytic amboceptor for sheep cells in rabbit serum, the complement and the normal agglutinin titer for *B. typhosus* were not altered by repeated bleedings.

The author suggests that the hyperleucocytosis, together with an increased lymph flow into the blood, enriching it in leucocytic extract or "leukine," as consequent of the repeated bleedings, causes the increase of bactericidal substances.—S. B-J.

785. Über das Auftreten spezifischer antihämolytischer Eigenschaften im normalen Serum nach, Behandlung mit Organen des heterogenetischen Typus. (*On the Occurrence of Specific Antihemolytic Substances in Normal Serum after Treatment with Organs from Animals of Other Species.*) F. Schiff. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 543–561.

Normal sera of man and rabbit are rendered specifically antagonistic to the hemolysis of sheep cells by an anti-sheep serum when these normal sera are treated with fresh sheep cells, sheep cells heated to 100°C. and with the emulsions of the following organs: lungs, kidneys, heart, liver, spleen and brain of guinea pigs; lungs and kidneys of the horse; lungs, kidneys and liver of dogs and chickens. This antilytic effect is comparable to the heterogenic antibody phenomena described by Pfeiffer and Friedberger and by Sachs. The antilytic properties conferred on sera in these experiments *in vitro* were obtained only with the cells of organs which presumably possessed heterogenic receptors. In the reactions, complement is not interfered with, but the sheep cell hemolysin is bound or united to the antagonistic substrate.—S. B-J.

786. Zur Biologie der Typhus bacillus. Ein Beitrag zur Wirkungsweise der Desinfektionsmittel und des Hungers auf Bakterien. (*On the Biology of the Typhoid Bacillus. A Study of the Effect of Disinfectants and Hunger on Bacteria.*) M. Feiler. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 303–343.

During growth on 1 per cent carbolic acid agar *B. typhosus* loses its flagella. Coincident with the loss of flagella, the characteristics of the agglutination of the bacillus changes. By titrations and absorptions of agglutinins it is shown that typhoid bacilli which have lost their flagella have also lost certain agglutinogens. When the anti-serum to the original strain was absorbed with that strain, agglutinins for both the original and carbolic acid strains were removed. When, however, this serum was absorbed with the carbolic acid strain, all agglutinins for the carbolic strain was removed, while agglutinins for the original strain remained. Absorption of an anti-serum to the carbolic acid strain by that strain and by the original strain removed in each case all agglutinins to both strains. The typhoid bacillus is thus shown to possess at least two kinds of agglutinogens, one associated with the endoplasm of the bacterium, the other with the ectoplasmic flagella.

Similar morphological and serological alterations were induced in *B. paratyphosus* B by cultivation on 1 per cent phenol agar.

The effects of bactericidal sera were not altered by these changes in the form and agglutinability of the microörganisms, nor was the resistance to physical and chemical disinfectants shown by the carbolic strain different from that of the normal strain. The virulence also was the same for both strains.

A "hunger strain" was produced by growing the typhoid bacillus on media containing minimal nutriment. The characteristics of this strain were midway between the original and carbolic strains.—S. B-J.

787. Über den Doppeltypus der Rezeptoren in der Typhus-Paratyphus-Gruppe. (*On the Duplicate Nature of the Receptors in the Typhoid-Paratyphoid Group.*) E. Weil and A. Felix. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 24–91.

The first part of this paper describes experiments on agglutination with certain bacteria called "paratyphoid-beta" isolated in Albania, Wolhynia and Asia Minor. In tests with the sera of patients from whom these organisms were isolated and the sera of rabbits immunized to these strains, some of the emulsions of living organisms of some strains are completely agglutinated in fine sandy particles, others are agglutinated in large flakes. The authors were able by absorption tests with appropriate strains to remove from the immune serum the agglutinin producing either large or small clumps. By heating the bacteria, their antigenic quality was so changed that it could be proved that the agglutinogen giving rise to an immune serum which produced large agglutination clumps was thermolabile, being destroyed in ½ hour at 100°C. The bacteria of this group are thereby shown to have two distinct receptors.

By the application of similar methods, the authors show that the sera of rabbits immunized to *B. typhosus*, *B. paratyphosus* A, *B. paratyphosus* B, and *B. enteritidis* (Gaertner) contain both fine and coarse-flocculating agglutinins. These types of agglutinins are shown to be related to differences in these microörganisms, in that typhoid, Gaertner, paratyphoid A and B bacilli contain a labile receptor which reacts with the "coarse agglutinin" and a stabile receptor, which unites with the "fine agglutinin."

Experiments are next reported in detail showing that the type of agglutination of these organisms can be altered by using suspensions of them from various substrates. The cultures grown on carbolic acid agar, acid and alkaline agar and alcohol containing agar, lose the receptor which is capable of uniting with the agglutinin causing large sized flocculation. When rabbits were immunized to the bacteria grown on the media mentioned above, their sera contained only the agglutinin which produced fine flocculation.

The agglutinins in the sera, however, have the same resistance to heat. Their specificity arises from the distinct agglutinogens or receptors of the bacteria.

Other bacteria studied in the same way provided similar data.—S. B-J.

788. Über die Beziehungen der Typhusagglutinine zu den Eiweisskörpern des Serums. (*On the Relation of Typhoid Agglutinins to the Proteins of the Serum.*) M. Schierge. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 527–542.

When serum is treated with kieselguhr or colloidal ferric hydroxide all the proteins can be removed. An antityphoid serum treated in this manner lost its agglutinins in proportion to the reduction of its proteins; when all proteins were removed, the serum or fluid was no longer capable of causing agglutination. The precipitate of proteins and ferric hydroxide solution was redissolved in the presence of sucrose, dialyzed, and filtered by a method which allowed a dissociation of the colloidal iron from the proteins. In the solution of the proteins thus recovered, agglutinins in about $\frac{1}{10}$ of the original titer were found. This is thought to indicate that in the serum the agglutinins are closely bound to the proteins.

Fractionation of the serum with ammonium sulphate, and testing the fractions for agglutinins showed that while the greater part of the agglutinins were precipitated with the globulin fraction, a certain amount of them were also in the albumin fraction. This partition of the antibodies between the globulin and albumin fractions is considered to indicate that the combination of proteins of the serum with agglutinins is not a chemical but a physical adsorption combination. The difference in the agglutinin content of the two fractions is attributed to a greater ability of the globulin to adsorb the antibody.—S. B-J.

789. Über die Agglutinine des normalen Rinderserums. (*On the Agglutinins of Normal Beef Serum.*) F. Breinl. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 491–498.

Since Weil and Felix have demonstrated that the agglutinins in the blood serum of patients with typhus fever and in the serum of an animal immunized to the various strains of *Proteus* are of two types: one causing fine flocculi; the other causing coarse clumps in agglutination tests, it occurred to the author that the natural agglutinins should be studied in the same way. To do this, he studied the types of agglutination-clumps produced by normal beef serum with X and O strains of *Proteus*, and with bacilli of the typhoid-paratyphoid group. In normal beef serum there are apparently these two types of agglutinins for these bacteria. They agglutinate bacterial emulsions in both fine and coarse flocculi. By using the O strain of the *Proteus* group, and by heating the emulsions of bacteria to 100°C. for two hours he was able to apply certain individual "receptors" to the sera as absorbing antigens. With these preparations, the agglutinin responsible for the fine type of agglutination could be removed from the sera, showing, therefore, that normal agglutinins are in this respect at least similar to those which arise when an animal is specifically immunized.—S. B-J.

790. Influence du foie sur le pouvoir agglutinatif du sérum. (*Influence of the Liver on the Agglutinating Power of Serum.*) B.-G. Duhamel and R. Thieulin. Bull. Acad. de méd., Par., 1920, **83**, 492–495.

The authors find that agglutinins are probably held in reserve in the liver tissue of immune animals and that the injection of electro-negative colloids causes the discharge of these agglutinins into the circulation.—G. H. R.

791. Die Verwendung neutralisierter Antiformin—Bakterienauflösungen zur Gewinnung hochwertiger agglutinierender Ruhrimmunsera. (*The Use of Neutralized Antiformin Solutions of Bacteria for the Production of Potent Agglutinating Antidysentery Sera.*) K. W. Jøtten. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 267–276.

When antiformin solutions of bacteria are carefully neutralized with 10 per cent sulphuric acid and dechlorinated with 10 per cent sodium sulphite, these extracts are not toxic and serve as excellent antigens for immunization. Neutralized anitformin extracts of Shiga-Kruse, and Flexner types of dysentery bacilli were studied in detail. These solutions were used in the immunization of rabbits and donkeys against dysentery bacilli. Only a few of the animals died as a result of the toxicity of the extracts. Nine days after a single injection of the neutralized antiformin solution of an agar plate culture of Shiga bacilli, rabbit serum showed an agglutinating titer of 1 to 12,800 and in one case 1 to 16,000. The animals thus withstand large doses of the bacterial solution and promptly produce agglutinating sera of high titer.—S. B-J.

792. Zur Theorie der Weil-Felixschen Reaktion. (*On the Theory of the Weil-Felix Reaction.*) F. Schiff. Ztschr. f. Immunitatsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 11–23.

A review of the studies of the agglutinin for *Proteus* X19 in the serum of cases of typhus fever leads to the conclusion that this agglutinating substance is a true specific antibody in the immunological sense of the word. The author, however, is not of the opinion that *Proteus* X19 has any causal relationship to typhus fever, and concludes that at present there is no satisfactory explanation to account for the phenomenon described by Weil and Felix, as the source of the antigen which stimulates the animal to produce agglutinin for certain strains of *Proteus* bacilli has not been discovered.—S. B-J.

793. *Über die hämolytische Wirkung des Meerschweinchen-serum im salzarmen Medium.* (*On the Hemolytic Action of Guinea Pig Serum in Salt-Poor Medium.*) W. Georgi. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 92–124.

The "salt poor medium" used in these experiments was a 4.15 per cent solution of glucose, which was isotonic for the blood cells used. Sheep cells were washed with this solution and serum dilutions were also made with it. The author compared the hemolytic activity of guinea pig serum against sheep cells in this salt poor medium with the hemolytic action of the same sera in physiological salt solution. In general, all tests showed that the action in salt poor medium was the reverse of that in physiological (0.85 per cent) saline. Thus the preliminary treatment of guinea pig serum with sheep cells at 0°C. scarcely reduced the hemolytic action of the serum in a salt poor medium, while it increased the hemolytic action in saline. The guinea pig serum was dialyzed for 48 hours against water, and the precipitate separated from the supernatant fluid. With these fractions it was found that in salt poor fluid, the supernatant only was hemolytic, while in physiological salt solution, the dissolved precipitate contained the hemolytic substances. When increasing amounts of sodium chloride were added to the serum solution in the salt poor medium, the serum which was originally hemolytic in dilute amounts lost that characteristic, and became hemolytic only in more concentrated solutions—thus changing its range of hemolysis from that characteristic of the serum-salt-poor-medium to that of serum in physiological saline. The addition of specific antisheep amboceptor to guinea pig serum in salt poor medium did not increase its hemolytic action for sheep cells.

On the basis of these data, comments are made upon the physical and chemical phases of hemolysis and complement inactivation. The lability of globulin, and perhaps other serum proteins, is pointed out.—S. B-J.

794. *Experimentelle Beiträge zur spezifischen Immunodiagnostik der Syphilis (Kutireaktion und Komplementbindung).* (*Experimental Studies on the Specific Immunological Diagnosis of Syphilis. The Cutaneous and Complement Fixation Reactions.*) W. Worms. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 357–396.

A long review of the literature on the subjects of skin reactions of syphilitics to the extracts of syphilitic organs and to extracts of *Treponema pallidum*, and a review of the papers reporting the results of complement fixation tests when extracts of a *Treponema pallidum* are used as the antigen, precede a report of the author's experimental work. In this review of the literature, the papers referred to are abstracted at length.

The spirochetes used for making the extracts tested by the author were cultivated from lesions of syphilis in man in the semisolid horse serum medium of Schereschewsky. When the cultures were pure, several strains of the spirochete were mixed, and extracted as follows: 1. Antiformin saline extract. 2. Alcoholic extract of spirochetes pulverized in saline antiformin. 3. Emulsion made with sodium chloride and formalin. 4. Autolysate in distilled water with the addition of formalin. The fluids used for control injections in the skin were these solutions to which spirochetes had not been added. These control and test fluids were injected intracutaneously in sufficient quantity to produce a small bleb about 0.5 cm. in diameter. Two hundred non-syphilitic and syphilitic patients were tested. The results were as follows:

In primary syphilis the skin reaction was positive in 70 per cent, while the Wassermann reaction was positive in 40 per cent. In secondary syphilis: Skin reaction positive in 86.4 per cent; Wassermann positive in 85.7 per cent. In latent syphilis: Skin test positive in 87.5 per cent; Wassermann positive in 100 per cent. In tertiary syphilis: Skin reaction positive in 66 per cent. The antiformin extracts were not as efficient in these tests as the saline emulsion and the autolysate in distilled water.

An antigen for complement fixation was made from polyvalent extracts of spirochetes (the culture extract of Schereschewsky, of which the details are not given in this paper). Extracts of syphilitic organs, according to the original Wassermann method, were also used. With these antigens, especially Schereschewsky's antigen "alcoholic extract of culture spirochetes," complement fixation tests agreed with the Wassermann reaction in 87 out of 100 comparisons. The tests with the spirochetal extract were often positive in certain cases of syphilis when the Wassermann reaction was negative.—S. B-J.

795. *Über das Verhalten experimentell Wassermann-positiv gemachter Sera gegenüber der Ausflockungsreaktion sowie über die Struktur des Syphilisserums.* (*On the Relationship of Sera Rendered Artifically Wassermann-Positive to the Precipitation Reaction, with Observations on the Structure of Syphilitic Serum.*) E. Nathan. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 562–580.

Fresh active normal sera, which do not fix complement in the usual Wassermann reaction, can be made "Wassermann-positive" by treatment with N/200 HCl in distilled water, with bacterial suspensions and a suspension of inulin. It is supposed that these procedures alter the degree of dispersion of the globulin. Such sera, artificially rendered Wassermann positive, were tested also to determine whether they caused a precipitate of an alcoholic extract of beef heart, as used in the Sachs-Georgi reaction. No precipitation was caused in such tests. It was found, therefore, that while a serum could be rendered Wassermann positive, it nevertheless remained negative to the Sach-Georgi reaction.

The author concludes that sera made by experiments such as these to react positively in the Wassermann test do not give any information as to the substances which in the serum of a syphilitic patient give both a positive Wassermann reaction and a precipitation in the Sachs-Georgi test.—S. B-J.

796. Beiträge zur Kenntnis der Wassermannschen Reaktion und ihrer Beziehungen zur Ausflockung. (*The Wassermann Reaction and its Relationship to Precipitation.*) P. Neukirch. Ztschr. f. Immunitätsforsch. u. Exper. Therap., I. Orig., Jena, 1920, **29**, 177–216.

In comparing the results of complement fixation tests and the precipitation phenomenon described by Sachs and Georgi, the author finds in general an agreement, but also certain differences. The precipitate formed when serum is added to the cholesterinized alcoholic extract of beef heart is of two kinds, one occurring at low temperatures with all sera, normal as well as syphilitic, the other occurring at 37°C. only with syphilitic serum. The first kind of precipitate does not fix complement, and hence these sera, while showing a positive Sachs-Georgi reaction, are negative in the Wassermann reaction. The incubator temperature 37°C. is therefore recommended for the Sachs-Georgi reaction. Fresh active serum forms a precipitate with organ extracts at low temperatures as well as at 37°C., while serum inactivated by heat at 55°C. for ½ hour causes a precipitate only at 37°C. Guinea pig serum also influences this precipitate. When active fresh guinea pig serum is added to the mixture of human serum and the alcoholic extract of beef heart it decreases or hinders the precipitate. If active guinea pig serum is added after the precipitate is formed, it dissolves the non-specific precipitate which occurs in the cold-incubation referred to above, but does not dissolve the precipitate formed when the mixtures are incubated at 37°C. This shows further distinct differences in the kinds of precipitates formed at different temperatures by active and inactivated sera.

In a separate section, the effect of salt-concentration upon complement fixation was studied. The author found that by a slight reduction of the salt concentration, from 0.85 per cent to 0.72 per cent, in the fluid in which the Wassermann reaction was performed, weakly positive reactions became more strongly positive, and some sera which gave negative reactions in 0.85 per cent salt solution, gave weakly positive reactions when the salt concentration was reduced.—S. B-J.

797. Comparative Value of Complement-Fixation Methods in Syphilis. Howard D. McIntyre, Emerson A. North and Aurelia P. McIntire. J. Lab. & Clin. M., St. Louis, 1921, **6**, 233–248.

The authors find cholesterinized antigen properly prepared and titrated gives 10 to 15 per cent more positive reactions than does the plain antigen and believe it a perfectly safe antigen to use in the Wassermann test with complement fixation in the ice box at 20°C. for a period not exceeding 10 hours. They also believe a positive Hecht-Gradwohl test in the temperate zone is diagnostic of syphilis and that it may be used in from 95–98 per cent of fresh serums. It gives 15 per cent more positive reactions with luetic serums than does the Wassermann test. It does not give a positive reaction in tuberculosis. The authors find the 3 serologic reactions appear in the serum and disappear after treatment in the following order:

The first to appear positive is the ice-box Wassermann test followed by the Hecht-Gradwohl test and then the water bath Wassermann. The disappearance under treatment is in the reverse order.—F. W. H.

798. Beitrag zur Kenntniss der Wassermannschen Reaktion. (*Contribution to the Knowledge of the Wassermann Reaction.*) F. Breinl. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 463–475.

It is shown in this paper that the complement-binding substances in syphilitic serum are different from those which cause positive Sachs-Georgi and Bruck reactions. The method of study was as follows: Two grams of a powder of dried beef heart were added to 2 cc. of normal syphilitic sera. This emulsion was incubated for 1 hour at 37°C. and cleared by centrifugation. Complement fixation and the other reactions were then done on the clear supernatant fluid. The complement fixation reaction remained positive with this fluid, while the Sachs-Georgi test became negative. By further absorption with the emulsion of beef heart, all the complement binding substances could be removed from the syphilitic sera. From the sediment, resuspended in salt solution, and cleared again by centrifugation, a fluid was obtained which gave a positive complement fixation test, but a negative Sachs-Georgi and Bruck reaction. This fluid contained only a small amount of protein, and a further study of the globulin fraction led to similar results.

The complement binding substances in syphilitic sera, therefore, are thought to be independent of the amount and physical-chemical condition of the serum-globulin.—S. B-J.

799. The Whys and Wherefores of Unreliable Wassermann Reports. William Krauss. South. M. J., Birmingham, 1921, **14**, 186–190.

A discussion of the various factors entering into the test with the author's methods of making each factor constant and reports dependable.—J. H. B.

800. Untersuchungen über die Lipoid-Fällungsreaktionen syphilitischer und normaler Seren. (Studies on the Lipoid Precipitation Reactions of Syphilitic and Normal Sera.) W. GLOOR AND R. KLINGER. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 435–444.

After removal of the globulin from the serum of syphilitics the remaining fluid, containing albumin, has the capacity of fixing complement in the presence of an alcoholic extract of beef's heart. The globulin was removed by acidifying the serum with 9 volumes of N/300 HCl, which caused this fraction of the protein to precipitate. Certain luetic and normal sera, however, when heated to 60°C. for 1 hour become more inhibitory to the hemolytic reaction. This property is entirely related to the globulin fraction, as removal of the globulin prevents these positive reactions.

Various experiments on the protein fractions of serum showed, finally, that syphilitic sera give strong positive Wassermann reactions even after removal of the globulin. On the other hand, the positive reactions which can be produced with normal sera artificially by shaking, digestion with bacteria and agar are associated with the globulin in these sera, and are reduced when the globulin is removed. These experiments suggest that in syphilitic sera there is not only an alteration in the amount or lability of the globulin, but that there is a chemical affinity between the albumin fraction and the extract lipoids which may account for the positive results in Wassermann reactions.—S. B-J.

801. Studien über die Sachs-Georgische Ausflockungsreaktion. (Studies on the Sachs-Georgi Precipitation Reaction.) P. NEUKIRCH. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 498–526.

In the dilution of the serum and alcoholic organ extract used in the Sachs-Georgi reaction, $NaNO_3$, Na_2SO_4, NaBr, KCl, and sodium acetate can be substituted in equimolecular solution for NaCl without influencing the result of the reaction. $CaCl_2$ and $MgCl_2$, and high concentrations of sodium acetate and sodium sulphate have a strong precipitating effect on the organ-extract.

The optimal H-ion concentration for the Sachs-Georgi reaction is about 4×10^{-6}, which is the isoelectric point of the serum globulin. These reactions were determined electrometrically.

A number of experiments were done to determine the effect of the addition of animal charcoal, kaolin, kieselguhr, as adsorption agents upon sera. In general, when inactivated serum was treated with kieselguhr, the precipitation was diminished in the presence of the alcoholic organ extract. The effect of these adsorbing agents is apparently different from the effect of heat upon serum. These studies are to be carried further.—S. B-J.

802. Zur Theorie der Meinickeschen Reaktion. (On the Theory of the Reaction of Meinicke.) M. JOEL. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 249–267.

As Meinicke has shown, when an alcoholic extract of beef heart is diluted with water and then added to blood serum a precipitation occurs. On the addition of sodium chloride solution sufficient to make the salt concentration about 2.5 per cent, the precipitate formed by normal sera dissolves, while the precipitate formed by sera from syphilitics remains. Joel compared this reaction with the Wassermann reaction in 156 cases, and found that it agreed with the Wassermann reaction in 86.1 per cent of the tests. He found that the type of alcoholic organ extract used was of considerable importance, as negative results, contrary to expectations from clinical histories were in most instances attributable to the unsuitability of the organ extract.

Studies were made to determine, if possible, whether the substance in the serum of syphilitics which gave a positive Wassermann reaction was identical with that which gave a precipitate insoluble in salt solution in the Meinicke tests. The precipitate and the supernatant fluid from the precipitation tests were then used in complement fixation reactions. In some instances both the supernatant and the precipitate fixed complement, in others either the supernatant or the precipitate had this property. The author thinks that the substance giving a positive Wassermann reaction is the same originally as that which enters into the precipitate observed by the Meinicke test. In studies of the colloidal flocculation and precipitate formation of mixtures of serum and alcoholic organ extracts under the dark field microscope, a difference was noted between the kinds and aggregation of the particles formed in the presence of normal or syphilitic sera. The author suggests that this precipitate is due to the formation of a lipoid-protein combination.—S. B-J.

803. Die Lipoidbindungsreaktion. Dritte Mitteilung. (The Lipoid-Combination Reaction. III.) E. MEINICKE. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 396–434.

The author gives some data to show that the lipoid-compound reaction described by him may be used as an indicator in many immunological tests. Three modifications of the method have been described, each possessing certain advantages for the investigation of certain conditions. In this paper, the third modification is used to indicate the reaction which occurs when immune serum from animals with glanders is added to an antigen prepared from glanders bacilli.

Extracts of dried horse-heart were found to show different precipitation phenomena according to their method of preparation. Ether, chloroform and benzol extracts of dried horse's heart were the only useful extracts for this reaction.

The salt-insoluble precipitate which forms when these extracts are added to immune sera is thought to be a physical chemical compound of the lipoid in the extract with the globulin in the serum.—S. B-J.

SERUM THERAPY

(*See also Numbers 615, 640, 737*)

804. Red Cell Refusion in the Production of Therapeutic Sera. W. J. Penfold. Med. J. Australia, Sydney, 1920, Vol. 2, No. 13, 307–318.

This paper describes in considerable detail the bleeding of horses for therapeutic sera with a return of the red cells. The author shows that bleedings may be made every other day for four days, of from 8 to 12 liters without producing anemia provided the red cells are returned. As much as 60 liters have been removed during a period of 10 days. Studies were made as to the effect on antitoxins content also agglutinins in cases of other sera. The method is suggested for use in human beings in rémoving poisons from the blood.—C. P. B.

805. Nouveau procédé de préparation des sérums thérapeutiques. Serum antityphique. (A New Procedure for the Preparation of a Therapeutic Antityphoid Serum.) J. W. Howard. Bull. Acad. de méd., Par., 1920, 84, 147–149.

The author obtains his serum by combining the methods of actively and passively immunizing his animals. The supersaturation of the serum with bacteria and toxic products is carefully avoided. The scheme of immunisation is to inject immune serum at first, then serum plus living bacteria, then bacteria alone, and finally 25 cc. of serum from another species (fresh sheep serum) to absorb any toxic substances free in the serum. This system is followed through 5 animals using the serum of the previous animal in each case. The serum of the fifth animal has given excellent results in the treatment of typhoid fever.—G. H. R.

ANAPHYLAXIS

806. Ocular Reactions in Anaphylaxis. R. Kodama. J. Infect. Dis., Chicago, 1921, 28, 48–61.

The ocular reactions to horse serum instilled into the conjunctival sac, injected into the orbit, and injected intravenously were studied in normal guinea pigs and in guinea pigs sensitized to horse serum. Precautions were taken to insure accuracy in the measurements of the lid slits and pupils of these animals, and the effect of light upon the pupillary reactions was controlled by using throughout a constant source of illumination.

The immediate effect of the application of horse serum to the eye of the normal and sensitized guinea pig is a dilation of the lid and pupil, succeeded by contraction. In the sensitized animal the response is more prompt and vigorous. It is suggested that the primary and secondary effects of anaphylaxis on the smooth muscles of the lid and iris of guinea pigs involve the ends of both the true and parasympathetic nerve fibers.

Dilation of the pupil followed by contraction, edema and congestion of the lid, conjunctiva, iris and ocular fundus and hemorrhages of epibulbar and retinal vessels are also seen when sensitized guinea pigs are given intravenous injections of the protein to which they are anaphylactic. These phases of shock are attributable to vascular changes.

The pathological lesions thus produced were not studied microscopically.—S. B-J.

807. Über die Pharmakologishen Wirkungen des defibrinierten Blutes. 2 Mitteilung. (Concerning the Pharmacological Action of Defibrinated Blood. Second Communication.) Hermann Freud. Arch. f. exper. Path. u. Pharmakol., Leipz., 1920, 88, 39–79.

A study of the circulatory reactions to the blood of the same species in cats, dogs and rabbits. Defibrinated blood injected intravenously within 15 minutes of bleeding gives, besides symptoms of collapse of central origin, peripheral vaso-dilation in decerebrate animals as well as normal, and inhibition and poisoning of the heart. The heart action is, in the cat, independent of vagus action; in the rabbit, it is dependent thereon. Rabbit blood is more toxic than cat, in both species.

After longer standing, the heart action disappears, and a peripheral vaso-constriction with rise of blood pressure is obtained, which is less intense but longer lasting than the epinephrin effect. Preliminary injection of blood in this condition inhibits the heart and vasodepressor action of fresh blood; it also amplifies the action of drugs of the digitalis series administered in otherwise ineffective dosage.

The primary toxicity may be elicited, though to a less degree, by agitating fresh citrated blood, otherwise inoffensive, with beads. It is referred to some substance liberated from the platelets.—L. A. K.

VACCINE THERAPY

(*See also Numbers 616, 629, 641, 649, 683, 767, 777, 778*)

808. *Massive Infection of a Vaccinated Person with Bacillus typhosus.* Brooks C. Grant. J. Am. M. Ass., Chicago, 1921, **76**, 514.

A person who never had typhoid fever, but was vaccinated with triple typhoid vaccine received a massive dose of living typhoid bacilli. On the fourth day headache developed and a feeling of malaise and on the eighth day headache and weakness. *B. typhosus* was recovered from the stool after 12 days but disappeared by the fifteenth day. The bacilli were not found in the blood and no fever developed at any time. It was thus demonstrated that typhoid vaccine may protect even when the infection is much more severe than is usually the case.—P. G. H.

809. *Biologic Therapy. XII. Rabies Vaccine.* A. M. Stimson. J. Am. M. Ass., Chicago, 1921, **76**, 241.

The prepared virus for injection consists of a liquid suspension of more or less modified fixed virus. It is administered by subcutaneous injection for a period which varies up to 3 weeks. Immunization must be completed during the incubation period of rabies which is unusually long. In a case of severe exposure the incubation period may be too short for complete artificial immunization and the treatment then fails. In some cases the individual does not respond to the treatment. In a very small proportion of treated individuals a paralytic condition develops. About one-fourth of these cases end fatally while the rest usually recover.—P. G. H.

810. *Biologic Therapy. XIII. Pertussis Vaccine.* Wilburt C. Davison. J. Am. M. Ass., Chicago, 1921, **76**, 242.

Judging from the literature, injections of Bordet-Gengou bacillus vaccines may have a slight though unreliable prophylactic effect, but therapeutic inoculations are practically of no value.—P. G. H.

811. *Biologic Therapy. XIV. Cholera Vaccine.* Oscar Teague. J. Am. M. Ass., Chicago, 1921, **76**, 243.

The vaccine made at the government laboratory in Bombay contains 8000 million organisms per cubic centimeter; 0.5 cc. is administered subcutaneously as the first dose and 1 cc. as the second dose. Reports are distinctly favorable. The administration of 2 or 3 doses of cholera vaccine offers a marked degree of protection against cholera. This protection lasts for 3 months and there is perhaps some protection for 6 months. Some of the vaccinated contract cholera, but it is claimed that in these cases the disease runs a milder course than in unvaccinated individuals. No effect has been observed by vaccinating carriers. Benefit of treatment of patients with cholera vaccine cannot be expected on account of the acute onset and rapid course of the disease.—P. G. H.

812. *Biologic Therapy. XV. Vaccination against Plague.* Oscar Teague. J. Am. M. Ass., Chicago, 1921, **76**, 243.

Haffkine's vaccine consists of a broth culture grown for 6 weeks at room temperature. The culture is killed by heating to 65°C. and 0.5 per cent phenol is added. Local reactions following injections are much severer than from typhoid vaccine. Another vaccine is prepared by suspending 24-hour old agar cultures in salt solution and heating for one hour to 65°C. There is no doubt as to the efficacy of the vaccine, but eradication of the disease cannot be accomplished by vaccination because the virus is carried by rats. The beneficial effect of the vaccine applies only to the bubonic form of the plague. No influence has been observed on the pneumonic form.—P. G. H.

813. *Biologic Therapy. XVI. The Use of Vaccines in the Prevention and Treatment of Influenza and its Sequels.* Frederick P. Gay. J. Am. M. Ass., Chicago, 1921, **76**, 244.

A vaccine prepared from cultures of various strains of influenza bacilli has been found to exert a beneficial influence by some observers while others found no such influence. A vaccine prepared from influenza bacilli, pneumococci, streptococci and staphylococci has also been used on a large scale. The mixed vaccine has found enthusiastic advocates who report favorable results. McCoy did not find such results. The beneficial results are attributed to a nonspecific protein reaction, since similar results were obtained by using typhoid vaccine.—P. G. H.

814. *Sur l'emploi de la formaldéhyde pour la préparation des vaccins inanimes.* (*The Use of Formaldehyde in the Preparation of Killed Vaccines.*) S. Costa. Bull. Acad. de méd., Par., 1920, **84**, 55–57.

Any bacterial vaccine, killed with formaldehyde preserves its physical and immunological properties much better than a vaccine killed by other methods. The method of the author is as follows; the bacterial growth is washed off the agar with a small amount of physiological salt solution; a solution of 1:50 commercial formalin is added to the emulsion in quantity to make a mixture of 1:300; the preparation is then set upon ice. For use, the vaccine is centrifuged or allowed to precipitate spontaneously, the supernatant fluid is removed and replaced by salt solution. Severe reactions with this vaccine have not occurred.—G. H. R.

NONSPECIFIC THERAPY

815. *Biologic Therapy. XVII. Foreign Protein Therapy in the Acute Infections.* JOSEPH L. MILLER. J. Am. M. Ass., Chicago, 1921, **76**, 308.

Proteins used are normal serum, proteoses, sodium nucleinate, milk and colloidal metals. A febrile reaction follows injection, preceded by a chill. A leucopenia followed by a polymorphonuclear leucocytosis reaches its maximum in 2 to 12 hours after the chill. Foreign protein therapy has been used chiefly in arthritis and typhoid fever. Favorable results have been reported in some cases. As a rule only a few cases are decidedly benefited. About 20 per cent of cases of typhoid fever are terminated after 1, 2 or 3 injections. Holler reports 350 cases treated intravenously with deuteroalbumose. There were only 2 fatalities and without hemorrhage or perforation. The mortality in typhus fever has been reduced bv protein treatment. Some cases of pneumonia have been benefited by use of typhoid vaccine and it is suggested that the beneficial effect of pneumococcus vaccine is possibly due to the presence of foreign protein. Treatment of syphilis is doubtful, but rheumatic iritis has given favorable results. Treatment with foreign protein is free from danger if the dose is calculated to be just sufficient to produce a chill. The permanent value of the treatment is still to be determined, but the immediate disappearance of all evidence of infection in small percentage of cases is established.—P. G. H.

816. *Biologic Therapy. XVIII. Nonspecific Protein Therapy in Arthritis.* DAVID MURRAY COWIE. J. Am. M. Ass., Chicago, 1921, **76**, 310.

Remarkably beneficial effects have followed the intravenous injection of foreign protein in arthritis and periarthritis. However, the effect has often been of short duration. Relief from pain will often follow protein therapy. Acute or subacute processes that have not progressed beyond the first year give the best results. Injections may be given daily. Reactions may be so severe, however, that it may be best to let a day intervene between injections. Sterile albumose solutions, horse serum and bacterial proteins produce similar results. Typhoid vaccine is most generally used. The severity of the reaction is proportionate to the dose given.—P. G. H.

817. *Biologic Therapy. XIX. Intravenous Protein Injections in Urology and Dermatology.* HARRY CULVER. J. Am. M. Ass., Chicago, 1921, **76**, 311.

Gonococci, meningococci, colon bacilli and proteose preparations produce good results in the treatment of gonococcal arthritis and epididymitis. It is believed that improvement or cure depends in great measure upon the intensity of the reaction and on processes associated therewith. Little, if any, effect is noted in orchitis or mumps or in nonspecific epididymitis. In chronic skin lesions encouraging results have been noted by the use of the protein reaction.—P. G. H.

818. *Biologic Therapy. XX. The Nonspecific Reactions.* W. F. PETERSON. J. Am. M. Ass., Chicago, 1921, **76**, 312.

Nonspecific therapy, also called protein therapy, ergotropic, omnicellular plasma-activation or heterotherapy, probably formed the basis of the earliest and primitive methods of practice. Under a variety of modern terms it is encountered as autoserotherapy, tuberculin injection, nuclein injection, etc. The method apparently is not in accord with modern conceptions of immunity, but is therefore not illogical nor purely empirical. Nonspecific therapy should be used early in the disease if it is to be successful. The system becomes more resistant to poisons due to a condition known as antianaphylaxis or desensitization. The nonspecific reaction is diphasic. The first or negative phase is an intensification of disease manifestations, the second or positive phase is a clinical improvement with reconstruction. Large doses should not be given and treatment should not be applied when the patient is no longer capable of reacting to stimulation or if a latent inflammatory focus is activated. It should be kept in mind that nonspecific therapy is still in an experimental stage and we are not fully competent to judge the ultimate range of its usefulness.—P. G. H.

819. *Zur Proteinkörpertherapie unter besonderer Berücksichtigung der Syphilis. (Protein Therapy, Especially with Respect to Syphilis.)* KARL SCHREINER. Wien. klin. Wchnschr. 1920, **33**, 748–750.

Intravenous peptone (0.5 cc. of a 1 per cent solution) injections are administered along with specific medicament like salvarsan, and cure seems to be accelerated by this procedure.—B. C.

EXPERIMENTAL INFECTION

820. *Experimental Streptococcus Empyema. II. Attempts at Dye Therapy.* F. P. GAY AND L. F. MORRISON. J. Infect. Dis., Chicago, 1921, **28**, 1–17.

The authors report numerous experiments upon the action of dyes upon streptococci in simple solutions, in pus, and in empyema, which they were able to produce regularly in rabbits. Among the most active bactericidal and bacteriostatic dyes against the streptococcus were dyes of the triphenylmethane series and acridine compounds. When these dyestuffs were tested for their action on streptococci in the pus of experimental empyema, many of them lost a great part or all of their bactericidal properties. Safronin, methyl green, basic fuchsin, acriflavine, and proflavine, however, were as active in pus as in broth.

When these active dyes were tested for therapeutic effect usually 5 cc. of a 0.5 per cent solution, or a lesser amount of a stronger solution of the dye was injected into the pleural cavity in which a streptococcal empyema had been produced. Apparently the cavity was not washed out by a solution of the dye. In many animals in which streptococci had been introduced into one pleural cavity, producing empyema, there was a streptococcal infection of the other cavity as well. Dyes injected into the empyemic cavity caused no improvement. The treatment did not prevent the death of the animal, although there were temporary periods of sterility of the pleural fluids. "The results do not justify anticipation of practical therapeutic results from the use of dyestuffs in empyema due to the streptococcus."—S. B-J.

821. Fate of Microörganisms Introduced into Isolated Loops of the Intestine. E. H. Eiskamp and L. K. Park. J. Infect. Dis., Chicago, 1921, **28**, 67–69.

Loops of duodenum and jejunum in dogs were isolated between ligatures, washed out repeatedly with physiological salt solution and then injected with 5 cc. of an emulsion of various bacteria. The emulsions usually contained from 5,000,000 to 150,000,000 organisms per cubic centimeter. The contents of each loop were thoroughly mixed by gentle massage, and 3 cc. of the sample of mixed contents removed for a study of bacterial antagonisms. The abdomen was then closed. After a period, varying from 2 to 5 hours, occasionally as long as 12 hours, the animal was killed and the contents of each loop removed. The total number of residual bacteria in each loop was determined by the ordinary dilution method used in counting bacteria in water. Aerobic plates only were studied.

Many of the bacteria were killed in these loops in periods ranging from 2 to 7 hours. Control cultures showed that the destruction was not due to the antagonistic action of the normal intestinal flora. The results indicate that the intestine exercises a definite antibacterial action.—S. B-J.

822. On the Action of Certain Salts on Phagocytosis and Virulence of Streptococci. T. Otsubo. J. Infect. Dis., Chicago, 1921, **28**, 18–26.

A mixture consisting of 0.5 cc. of M/8 solution of certain salts, and 0.5 cc. of normal sodium chloride solution and 0.5 cc. of a 24-hour growth of a hemolytic streptococcus in plain broth were injected into the peritoneal cavity of the mouse. After 3 hours, peritoneal fluid was withdrawn, preparations were made and the number of leucocytes engaged in phagocytosis as well as the average number of streptococci taken up by each leucocyte were counted. By this method, it was found that M/8 solutions of $MgSO_4$, $MgCl_2$, $SrCl_2$, Na_2CO_3, $NaC_6H_5O_7$ and $CaCl_2$ diminish phagocytosis of streptococci in the peritoneal cavity of the mouse. KI and KBr inhibit in lesser degree.

The presence of certain salts in the medium in which the streptococcus was grown apparently affected both the virulence and the lysin production of the organism. Emulsion of the streptococcus in these salts just before injection into the animal also affected the virulence. In these mixtures the NaCl strain of streptococcus was the weakest in virulence, while the "$Na_3C_6H_5O_7$ strain" was the most virulent. The effect of these salts on lysin production was irregular, and it was noted that the most virulent strain was not always the most actively hemolytic.

The injections of these salts into the peritoneal cavity slightly reduced the alkalinity of the blood, as measured according to Landois' method, and at the same time phagocytosis was diminished.—S. B-J.

823. Action de l'iode et des iodures sur le corps thyroide du cobaye sain et tuberculeux. (*Action of Iodine and of Iodides upon the Thyroid Body of Healthy and Tuberculous Guinea Pigs.*) F. Bezançon and S.-I. de Jong. Rev. de la tuberculose, Par., 3rd Ser., 1920, **1**, 36–39.

The thyroid gland of the normal guinea pig weighs 0.05 to 0.07 gram. KI or Gram's iodide causes the vesicles to distend and the epithelium to flatten out, but with an absence of interstitial hyperplasia, the reaction is more pronounced with subcutaneous injection than with mouth ingestion. With iodized water or oil there is a distinct and marked hyperplasia, increasing in weight to 0.36 gram at times. The gland in a tuberculous pig resembles that of a tuberculous person. Iodine has no influence on the course of the disease. The gland tends to become normal, the epithelium being entirely normal. KI on the other hand causes an intense vascular congestion.—T. G. H.

824. Über die sogenannte Fleckfieberinfektion des Meerschweinchens nach Übertragung von menschlichem Fleckfieberblut. (*On the So-called Typhus Infection of Guinea Pigs after Injection with Blood of Human Cases of Typhus Fever.*) E. Friedberger. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 125–176.

After studying the temperature reactions of guinea pigs which had been injected with the blood from patients with typhus fever, Friedberger thinks that the successful transmission of typhus fever from man to guinea pig has never been accomplished by this method. The weight curve of the guinea pigs injected with normal human blood show the same changes as that of guinea pigs injected with blood from typhus cases.

Certain precautions must be observed in taking the temperature of guinea pigs. The animals should be in rooms of the same temperature, have equal diets and should be used for this test at the same time. The same person should take all the temperature readings. The person taking the temperature should not know the result which the investigator expects. The thermometer should be inserted to the same depth in the rectum of each animal, and should be allowed to remain the same length or time in each animal. The temperature should be taken twice daily.

Charts are reproduced showing how failure to observe these rules may lead to irregularities in the temperature curves. When these precautions were observed, no differences were noted in the temperature reactions of guinea pigs injected with normal or typhus blood.—S. B-J.

CHEMOTHERAPY

(See also Numbers 763, 819, 823)

825. Zur experimentellen Chemotherapie der Pneumokokken-Infektion. II. Mitteilung. (On the Experimental Chemotherapy of Pneumococcus Infections. II.) J. Morgenroth and M. Kaufmann. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 217–227.

In a series of experiments on mice infected with the same dose of a strain of "pneumococcus Ia" by intraperitoneal injection, the therapeutic efficacy of a number of cinchonin compounds were compared. These cinchonin bases and compounds were injected in aqueous or oily solutions. Optochin hydrochloride was found to have the greatest protective action, as had been shown in previous experiments. While hydrocuprein failed to show any curative action, hydrochinin exhibited a weak action, which caused only a slight retardation of the infectious process. Isopropylhydrocuprein and normal propylhydrocuprein show a much reduced action as compared with ethylhydrocuprein (optochin). Isobutylhydrocuprein and isoamylhydrocuprein have only a slight action.

The influence of hydration on the activity of these compounds is shown, for example, in the greater efficacy of ethylhydrocuprein as compared with ethylcuprein. Cinchonin, hydrocinchonin and cinchonin hydrochloride were inactive as chemotherapeutic agents against pneumococcus infection.—S. B-J.

826. Todesfall bei Quecksilber-Neosalvarsanbehandlung. (Death Following Mercury-Neosalvarsan Treatment.) Robert Krüger. Deutsche med. Wchnschr., Berl. & Leipz., **46**, 1247–1249.

Attention is directed to the danger of combined mercury-salvarsan therapy even within prescribed dose limits. This is partly due to a hypersensitiveness of some patients and lowered resistance as well as to the inherent toxicity of the medicament.—B. C.

827. Studien über die chemotherapeutische Wirkung gewisser Quecksilberpräparateauf die experimentelle Hodensyphilis der Kaninchen, I. (Studies on the Chemotherapeutic Effect of Certain Mercury Preparations upon Experimental Syphilitic Orchitis in Rabbits, I.) Mulzer and Bleyer. München. med. Wchnschr., 1920, **67**, 1163–1166.

The course of an experimentally induced syphilitic orchitis or periorchitis in the rabbit as influenced by medicament is utilized as a criterion of what might be expected to happen in man. Only typical primary effects could thus be tested. "Mercedan," said to be a Na-Hg paranucleinate, was tested upon 9 rabbits. The lesions receded rapidly and spirochetes disappeared after 5 days. It appears, however, that the effective dose is very close to the toxic dose.—B. C.

828. Ueber Beziehungen der Chemie zur bakteriologischen Forschung. (On Relations between Chemistry and Bacteriological Research.) A. Marxer. Ztschr. f. Infektionsk. d. Haustiere, Berl., 1919, **20**, 202–217.

A lecture, largely on chemotherapy.—W. N. B.

MISCELLANEOUS

829. Report on Five Thousand Bloods Typed Using Moss's Grouping. William L. Culpepper and Marjorie Ableson. J. Lab. & Clin. M., St. Louis, 1921, **6**, 276–283.

Of the 5000 bloods 5.18 per cent fell in Goup I, 35.06 per cent in Group II, 14.28 per cent in Group III and 44.48 per cent in Group IV. The authors' experience leads them to believe in the probability of the overlapping of the types and this would explain a reaction in the recipient of blood from a donor of the same group. They find the reaction occurs best at 40°C., that heat does not impair it until coagulation occurs and that cold, bacterial contamination of the serum, the addition of purified cresol in a dilution of 1:250 and syphilis do not influence the reaction.—F. W. H.

830. *Über einige neuere, angeblich spezifische Organextraktgifte.* (*On a New So-called Specific Toxin from Extracts of Organs.*) H. Dold. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Orig., Jena, 1920, **29**, 276–286.

Dold calls attention to the systematic study of the toxicity of watery and saline extracts of normal and diseased organs which he published in 1911, and criticises the work of Wherry and Erwin, Olkon, Weiss, Kolmer, Steinfield, and Julia Parker, who have attributed specific properties to the toxic extracts of certain organs in certain conditions. He shows first that Olkon's work on the disturbances of growth and enfeebled condition of animals repeatedly injected with extracts of the thymus does not indicate that the thymus alone contains substances which disturb nutrition, as it has been shown that the extract of any organ will have a similar effect.

The greater toxicity of organs from animals with infections can be resolved into two factors, which account for this property without making it necessary to suppose that in these conditions the organs elaborate a specific toxin. One of these factors is the primary toxicity of the organ extract, and the other, as for instance in the case of a lung infected with pneumococci, is the toxicity of the bacterial substances in the tissues.

Exsanguination of an organ also influences the toxicity of its extract. Blood interferes with the reaction, and unless removed reduces the toxicity of the extract.—S. B-J.

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ABSTRACTS
OF
BACTERIOLOGY

UNDER THE EDITORIAL DIRECTION OF THE
SOCIETY OF AMERICAN BACTERIOLOGISTS

MAY, 1921

EDITOR
A. PARKER HITCHENS

It is characteristic of Science and Progress that they continually open new fields to our vision.—PASTEUR

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ABSTRACTS OF BACTERIOLOGICAL LITERATURE

CHARACTERIZATION AND CLASSIFICATION

(*See also Number 990*)

831. The Importance of Preserving the Original Types of Newly Described Species of Bacteria. C.-E. A. Winslow. J. Bact., Balt., 1921, **6**, 133–134.

In addition to the already existing museums for living bacteria (the Kral Museum in Vienna and the Museum of Living Bacteria at the American Museum of Natural History in New York, C.-E. A. Winslow, Curator) a new one has been established as the National Collection of Type Cultures by the Medical Research Council of Great Britain at the Lister Institute, under the direction of Dr. J. C. G. Ledingham. Arrangements are being made for exchange of cultures between the British and American Museums. The present note is presented to call the attention of bacteriologists to the facilities offered at the Lister Institute and the American Museum and to urge upon all who may describe new bacterial species the great importance of promptly depositing with one of the collections the original type strain so that it may be available for the comparative study of systematists in future years.—I. S. F.

832. Progress Report for 1920 Committee on Bacteriological Technique. H. J. Conn, Chairman, K. N. Atkins, I. J. Kligler, J. F. Norton and G. E. Harmon. J. Bact., Balt., 1921, **6**, 135–141.

Following an inquiry to instructors in bacteriology the committee has modified the descriptive chart. A portion of the detail contained in the older chart has been omitted and the remaining material condensed so that the whole is now contained on the two sides of a single 8½ by 11 inch sheet. The group number has been omitted, and an "index number" inserted. If this chart meets the approval of the Society it will be printed and will be ready for distribution at about the time that this report appears in the Journal. The old charts will still be kept on sale as long as there is any demand for them. All the charts may be obtained from the chairman of this committee (address Agr. Exp. Station, Geneva, N. Y.). A sample copy of the new chart will be sent anyone on request.

The committee is continuing its work on the investigation of methods of pure culture study. It is at present working on methods of determining acid production from sugars and other carbon compounds; methods of determining diastatic action on starch; modifications of the Gram stain.

The committee is devoting attention to the methods of counting bacteria. In this report the dilution method, the plate count and the microscopic method and the criteria by which the methods are to be judged are discussed. The committee expects to give this subject considerable attention. Work is being done on the problems of microorganisms in ketchup, and on the matter of standardization of stains. The cooperation of interested readers is earnestly desired.—I. S. F.

833. The Generic Names of Bacteria. Ella M. A. Enlows. Hyg. Lab. Bull. No. 121, Wash., 1920, p. 4–111.

The bulletin lists all of the names used in the literature to define genera of bacteria, so far as it has been possible to obtain them. The description of these genera is briefly given when such description could be obtained, with the idea that it might be of assistance to the systematist or others interested in classification of genera and species of bacteria.

The type species only, or an organism which seemed most representative, has been included under each genus, except in doubtful cases where several species are included so that at least some idea of the genus in question may be ascertained. A list of the species mentioned in the bulletin is appended.—I. A. B.

834. The Nomenclature of the Actinomycetaceae (Addenda). R. S. Breed and H. J. Conn. J. Bact., Balt., 1920, **5**, 489–490.

In accordance with the internationally established procedures in botany and zoology, it appears that the name *Actinomyces* Harz for this group of organisms is valid and is not in conflict with the name *Actinomyce* Meyer because of the difference in the terminations. The two names are not be considered homonyms. *Actinomyces* Harz should be retained rather than *Discomyces* Rivolta.—I. S. F.

835. The Tropin Reactions of Antimeningococcus Serum. Alice C. Evans. Hyg. Lab. Bull. No. 124, Wash., 1290, p. 43–87.

The investigation here reported shows that the phagocytic test for bacteriotropins is a workable test which distinguishes clearly between a normal serum and a serum containing the specific antibodies. The important phagocytic antibodies in meningococcic serum concerned are bacteriotropins which are not dependent upon complement for their activity.

No strains of meningococci were found which resisted phagocytosis after treatment with serum containing the specific tropins, and all strains of meningococci tested produced tropins in inoculated rabbits. The tropin reactions of meningococci are specific, dividing them into well defined groups, with no cross reactions between the typical strains of the main groups.

Four distinct groups were found among 63 strains, and a fifth group which was interrelated with the other four.—I. A. B.

836. *Differentiation between Various Strains of Meningococci by Means of the Agglutination and the Absorption of the Agglutinins Tests.* C. T. Butterfield and M. H. Neill. Hyg. Lab. Bull. No. 124, Wash., 1920, p. 9–42.

The results of the study are summarized as follows:

"Classification of strains according to their geographic distribution is not possible. When the agglutination test with type sera prepared from Gordon's types was applied to the Hygienic Laboratory strains, 90 per cent of them were classified without further work. If the meningococcus suspension agglutinates in a titre of 1:100 or higher with only one of the type sera, provided the homologous coccus agglutinates in over 1:400, it may in 100 per cent of the cases be classified at once without resorting to the absorption test. If a meningococcus suspension agglutinates with 2 or more type sera in equal titre, it may in 100 per cent of the cases be classified by the absorption test. If a suspension agglutinates with 2 or more type sera in unequal titre the highest titre probably indicates the type. This was true in 77 per cent of the cases tried.

"In the monovalent sera tried, the complement fixation bodies have the same specificity as the agglutinins; the complement fixation titre being as a rule somewhat higher than the agglutination titre.

"During the course of a year's time the apparent changing of certain strains of meningococci from one type to another has been observed.

"A graphic method of selecting representative strains is presented."—I. A. B.

837. *The Fermentation Reactions and Pigment Production of certain Meningococci.* Clara E. Taft. Hyg. Lab. Bull. No. 124, Wash., 1920, p. 90–92.

Changes in hydrogen ion concentration of meningococcus cultures grown in serum broths containing dextrose, saccharose and maltose were determined by the colorimetric method after 4 days' incubation. All of the 64 Hygienic Laboratory stock cultures tested produced acid in dextrose and maltose. Only 5 cultures had any appreciable effect on saccharose.

The 64 strains of meningococci were tested for pigment production by the Color Charts of Ridgway's Color Standards and Nomenclature (1912). Forty-nine of the cultures fell with tint "d" on the 19″ YO-Y series of Plate XXX, called cream buff. Sixteen of the cultures matched with tint "f" of the 19″ YO-O series, a lighter tone, called cream color. All of the cultures were one week old when tested except two 8-day cultures and one 11-day culture.—I. A. B.

838. *Dissociation of Microbic Species.* Paul H. De Kruif. J. Am. M. Ass., Chicago, 1921, **76**, 651.

Cultures of the bacillus of rabbit septicemia contain individuals of different character. When such individuals are dissociated they remain true to character. The question is raised whether varieties coexist in the original material or whether mutants appear after removal from the natural habitat.—P. G. H.

839. *Zur Frage der Streptokokkendifferenzierung nach Sigwart.* (*Differentiation of Streptococci According to Sigwart.*) Max Beckman. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1218–1219.

Sigwart claimed to differentiate virulent from avirulent streptococci by a cultural method. The procedure was to grow a pure culture of virulent streptococci in broth for 5 days, filter through a Berkefeld filter and reinoculate the filtrate with the culture to be examined. According to Sigwart, virulent streptococci will not grow in this filtrate while non-virulent types will. Beckman cites a number of cases in which the above procedure yielded no information of value.—B.C.

NEW SPECIES

(*See also Numbers 842, 887, 940, 953, 968, 989*)

840. *Notes on Some Bacterial Parasites of the Human Mucous Membranes.* W. W. Oliver and W. B. Wherry. J. Infect. Dis., Chicago, 1921, **28**, 341–344.

Brief descriptions are given of several imperfectly described members of the group of bacteria inhabiting the human mucous membranes. These are:

1. *Bacterium melaninogenicum* (n. sp.). This is a polymorphous Gram-negative rod-shaped anaerobic organism which produces a black pigment on blood-agar. This pigment is apparently a melanin.
2. *B. duplex-nonliquefaciens;* a non-liquefying member of the Morax-Axenfeld group, from which, however, it is distinguishable also by agglutination tests.
3. *M. minutissimus* (n. sp.). This is a small Gram-negative coccus, which is an obligate anaerobe.
4. *M. reniformis.* (*Diplococcus reniformis*, Cottet, 1900), isolated from vulvo-vaginitis. —S. B-J.

841. *Ueber den "Bacillus crassus" Lipschütz.* (*Bacillus crassus, Lipschütz.*) Emil Löwi. Wien. klin. Wchnschr., 1920, **33**, 730–733.

The name *Plocamobacterium crassum* (Lipschütz) is suggested as the most appropriate for this organism, which is a usual inhabitant of the normal vagina. It may, however, sometimes become pathogenic and produce an acute ulcer of the vulva. The organism is a Gram-positive facultative anaerobe. (Gram stain is sometimes negative.) Growth on Drigalski agar, maltose-nutrose agar and dextrose agar is particularly characteristic. Young cultures show small rods while older ones are filamentous. Motility is probably present. Spores are absent. Methods of diagnosis and identification are given.—B. C.

842. *The Acid-fast Actinomycetes with a Report of a Case from Which a New Species was Isolated.* A. T. Henrici and E. L. Gardner. J. Infect. Dis., Chicago, 1921, **28**, 232–248.

A review of the literature of human and other infections with actinomyces is given. The authors also describe a fatal human case from which a new species was isolated, for which the name *A. gypsoides* is proposed.—L. C. H.

BACTERIAL NUTRITION AND METABOLISM

843. *Hemotoxin Production by the Streptococcus in Relation to its Metabolism.* Majorie W. Cook, Virginia Mix and Ethel O. Culvyhouse. J. Infect. Dis., Chicago, 1921, **28**, 93-121.

This study was made with a culture of *Streptococcus pyogenes* isolated from the lung of a case of bronchopneumonia. Two cultures of this strain were used, one without animal passage, known as the laboratory strain, and one passed through rabbits, known as the passage strain. Rabbit corpuscles were used for the tests, bled into 1 per cent sodium citrate in 0.85 per cent salt solution. They were washed 3 times and resuspended in beef infusion broth. No attempt was made to determine the effect of varying the peptone content of the medium. Hemotoxin production was studied in plain beef infusion broth, in broth containing serum, carbohydrates and alcohols. It was found that hemotoxin production in fairly high concentration occurred after 1 hour incubation, the maximum being reached in 4–10 hours. This was in 5 per cent serum broth. No hemotoxin was developed in 1 per cent glucose broth; in serum glucose broth the maximum was reached in 10 hours with a rapid decrease thereafter. In plain broth there was slight production in 8–16 hours. Retardation and decrease of hemotoxin production was observed in all mediums containing carbohydrates which are fermented by the streptococcus, such as glucose, levulose, lactose, salicin and mannitol. Glycerol equalled serum in hemotoxin production. Hemotoxin was produced in the smallest amounts when the acidity of the medium increased most rapidly. Glucose added to hemotoxin once formed does not inhibit its lytic action. Removal of metabolic products by centrifugation and washing restored to a considerable degree the hemotoxic properties. The effect of acidity on hemotoxin production probably acts only indirectly by influencing the rate of growth. Hemotoxin is actively formed by cultures of pH ranging from 6.9–8.35. Addition of phosphate to prevent the accumulation of free acid gave results indicating that the acidity must be considered as a factor in the inhibition of hemotoxin by glucose. Neutralization of acid already formed by the addition of alkali had no effect in increasing hemotoxin production. Broth in which streptococci had been grown, when filtered and neutralized, became an excellent medium for hemotoxin production, indicating still further that acid products are the chief metabolic inhibitors of hemotoxin production in carbohydrate media. Addition of lactic acid to a serum broth culture inhibits hemotoxin formation. The rate of growth is also an important factor in maximum hemotoxin production.

Differences in hemotoxin production between the laboratory and the passage strains were observed, the latter producing much more hemotoxin than the former. By detailed study of the metabolism of the two strains in different media it was found that the hemotoxin formation was greatest with the strain showing the greatest rate of metabolism. In media in which the metabolism rates were about equal the hemotoxin production was parallel in each.—L. C. H.

844. *The Relation of Hydrogen-Ion Concentration to the Growth, Viability, and Fermentative Activity of Streptococcus hemolyticus.* Laurence F. Foster. J. Bact., Balt., 1921, **6**, 161–209.

Streptococcus hemolyticus ferments the common hexoses and disaccharides, but not the polysaccharides, with the production of a final pH between the limits 4.85 and 5.40. The variations in final pH are considerably greater in first than in second cultures. The same reduction in pH is produced in plain as in fermentable sugar broths. The buffering action of K_2HPO_4 upon the pH is not effective in concentrations up to 1 per cent in the presence of an adequate glucose supply. The addition of horse serum to the culture fluid increases the buffer content of the medium. The time curve for acid production presents a number of rate phases which are as distinct as the time curve of growth. Five characteristic periods are evident in the time curve of acid production: (1) stationary period, (2) lag period, (3) maximum rate period, (4) period of negative acceleration, and (5) maximum stationary period. The initial stationary and lag periods can be reduced to a minimum by employment of an inoculum from a parent culture of suitable age. The lag period in acid formation may be reduced by 2 to 4 hours by the addition of 5 per cent of horse serum to the glucose broth. Maximum production of hemotoxin has been found to occur between the sixth and eighth hours of incubation. The maximum period of acid production usually comes in the same period and is usually maintained for 2 hours. Acidity is believed to be the chief factor limiting growth, neutralization of the acid permits luxuriant growth of culture filtrates. Organisms live for longer periods in filtrates from active cultures than in broth brought to the same pH with either lactic or acetic acids. The presence of horse serum increases the tolerance for acid, as evidenced by increased viability in point of time.—I. S. F.

845. The Biochemistry of Streptococcus hemolyticus. LAURENCE F. FOSTER. J. Bact., Balt., 1921, **6**, 211-237.

In the fermentation of glucose by *Streptococcus hemolyticus*, lactic acid appears to be the principal acid formed. A smaller fraction of volatile acid is probably chiefly acetic acid and a trace of formic acid. As measured by ammonia production, glucose acts as a "protein sparer." During the periods of maximum growth glucose utilization, acid formation, and ammonia output progress at maximum rates. Decrease in formol-titration amino acids is concurrent with increase in ammonia. Following the stage of maximum growth rate, the amino acid output increases and the ammonia output falls. Distinct differences were observed in the early nitrogen metabolisms of a laboratory strain and of a culture from pleural fluid.—I. S. F.

846. L'agar de Levinthal comme milieu de culture de différentes bactéries et surtout du Mic. gonorrhoea. (The Agar of Levinthal as a Culture Media for Different Bacteria and especially for Mic. gonorrhea.) B. GALLI-VALERIO AND BORNAND. Schweiz. med. Wchnschr., 1920, No. **52**, 1177-1178.

Levinthal's medium is advocated for use in the isolation of gonococci from cases of acute gonorrhea. The medium is also suited to the growth of *Bact. diphtheriae*, the diptheroids, streptococci and the pneumococcus.—G. H. S.

847. The Growth of the Gonococcus in Various Gaseous Environments. G. E. ROCKWELL. J. Infect. Dis., Chicago, 1921, **28**, 249-258.

Two strains of gonococcus were used. When grown under partial tension in conjunction with a culture of hay bacillus a luxuriant growth is obtained. When transferred immediately to an atmosphere of hydrogen the growth is not so luxuriant but improves with successive transfers. When oxygen was removed by pyrogallic acid and sodium hydroxid no growth occurred. When it is adapted to oxygen it retains this characteristic with considerable tenacity. When a culture is adapted to growth under a high concentration of CO_2 it is unfavorably affected by oxygen but grows well under partial tension and under hydrogen. Oxygen is apparently an important factor in causing delayed growth. Viability is increased under partial tension as opposed to aerobic conditions.—L. C. H.

848. A Study of the Gaseous Requirements of Various Bacteria. GEO. E. ROCKWELL. J. Infect. Dis., Chicago, 1921, **28**, 352-356.

Some aerobic and facultative bacteria grow under hydrogen but not when pyrogallic acid and alkali are used to remove the oxygen. When CO_2 is present such organisms grow well in the absence of oxygen. Some organisms, such as the colon bacillus, grow well when the oxygen is removed by pyrogallate. This is probably due to the fact that such organisms produce CO_2 sufficiently rapidly during their growth. Growth of bacteria under anaerobic conditions is apparently favored by the presence of CO_2.—L. C .H

849. Effect of Deprivation of Food on Bacteria. H. BRAUN. Ztschr. f. allg. Physiol., Jena, 1921, **19**, 1-8.

When cultivated upon nutrient agar *B. proteus* produces the typical spreading colony and each organism when examined microscopically shows well developed flagella. If, however, the same strains grown upon an agar medium containing but 1/10 as much nutriment material and salts they form isolated colonies with no tendency to spread. Under microscopic examination only an occasional rod will show motility and when stained the majority of organisms lack flagella. Continued subculture upon such a "food-poor" medium results in complete loss of motility and the typical bacillary morphology is lost, the cells becoming much smaller and oval, simulating cocci. The same structural changes and physiological behavior take place if the organisms are grown upon a medium of abundant food supply but containing various agents of disinfection. Apparently the disinfectants alter the bacterial metabolism.

B. typhosus and paratyphoid under conditions of dietary deficiency also lose their organs of locomotion in large part and show definite atypical serologic relationships. Typhoid strains from a standard medium with abundant food supply induce the production of antibodies (agglutinins) capable of reacting with all typhoid antigens; sera produced with an antigen grown on a medium of low food value will agglutinate an antigen consisting of "undernourished" organisms in high dilution but it is relatively inert as regards the normal antigen. Absorption experiments showed that sera produced with a normal antigen can be absorbed completely by normal antigen, but when combined with the "undernourished" antigen only the agglutinins for that type of antigen are absorbed. On the other hand, sera produced by the injection of the "undernourished" antigen are absorbed completely by both types of antigen. Thus, deficient nourishment must affect the endoplasmic composition as profoundly as it affects ectoplasmic morphology.

Such treatment apparently does not affect the susceptibility to chemicals or to heat, nor is virulence modified.

These altered characteristics are not permanent although growth for 30 generations on an unfavorable medium so alters the organisms that they return to normal with extreme slowness and by slight gradations when they are returned to a fully nutrient medium.—G. H. S.

850. *The Activity of Staphylococci in Milk.* W. H. Barnes. J. Infect. Dis., Chicago, 1921, **28**, 259–264.

Bouillon cultures in which staphylococci had been grown for 96 hours were sterilized by the addition of 1 per cent formalin, and both the supernatant fluid and the bacterial sediment were tested for an enzymatic rennet-like action upon milk. It was found that these preparations, which were proved to be free from living staphylococci, were able to clot milk. It is shown, therefore, that staphylococci are capable of producing a milk curdling enzyme.—S.B-J.

851. *Note on the Indol Test in Tryptophane Solution.* Chr. Barthel. J. Bact., Balt., 1921, **6**, 85–88.

Experiments with Zipfel's medium for the test of indol liberation from tryptophane indicated that failures to get growth or indol were probably due to the high hydrogen ion concentration (pH = 5.41) of this medium when prepared according to Zipfel's directions. Consistent results are obtained if the medium is neutralized to litmus before sterilization. The ammonium lactate specified by the author of the method (Zipfel) is not necessary in the medium.—I. S. F.

852. *Uber die Ursachen des Leuchtens der Leuchtbakterien.* (*On the Cause of Phosphorescence by Phosphorescent Bacteria.*) F. C. Gerretsen. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1920, **52**, 353–373.

In nutrient solutions for the growth of phosphorescent bacteria, the Cl-ion of the NaCl can be replaced by various other anions, without affecting materially the light production. The cation (Na) can be replaced only by Mg, but when both the cation and anion are replaced, the phosphorescence is greatly diminished. Peptone can be used both as a source of nitrogen and carbon and cannot be replaced by any other single nitrogen source, without affecting the phosphorescence. Ultraviolet light destroys the power of reproduction of the bacteria, without injuring the phosphorescence. The phosphorescent bacteria produce an intracellular phosphorescent substance (photogen), ascribed by the author to the action of an enzyme, photogenase. The oxidation of the photogen resulting in light production is probably accomplished by means of an oxydase (luziferase).—S. A. W.

853. *Uber die Angreifbarkeit organischer Verbindungen durch Mikroorganismen.* (*The Utilization of Organic Compounds by Microorganisms.*) P. E. Verkade. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1920, **52**, 273–280.

A continuation of the previous work on the assimilation of organic compounds by microorganisms, considering the plasma membrane as a lyophile colloid.—S. A. W.

854. *Sulla tossicita dell'ossigeno per gli anaerobe.* (*The Toxicity of Oxygen on Anaerobes.*) A. Zironi. Boll. d. Ist. Sieroterap. Milanese, Milano, 1920, **4**, 189-203.

Experimental data show that the oxygen of the air is inactive on certain enzymes of anaerobes. The oxygen of the air only inhibits multiplication.—P. M.

PHYSICAL CHEMISTRY

(*See also Number 1045*)

855. *Ueber die oligodynamische Metallwirkung auf Bakterien.* (*The Oligodynamic Effect of Metals upon Bacteria.*) K. Süpfle. München. med. Wchnschr., 1920, **67**, 1166–1168.

It is believed by some that copper and certain other heavy metals possess a new physical property which is transferable slightly to water and other fluids, and which is manifested by a bactericidal action (oligodynamic effect) upon organisms suspended therein. Süpfle analyzes all the evidence and shows that this property is most logically explained as being due to simple solution of the metal which then acts chemically as a disinfectant. There is no need whatever for the assumption of a mysterious physical force.—B. C.

BACTERIOLOGICAL TECHNIC

(*See also Numbers 1043, 1044*)

856. *Second Improved Method for the Demonstration of Spirochaeta pallida in the Tissues.* Alfred Scott Warthin and Allen C. Starry. J. Am. M. Ass., Chicago, 1921, **76**, 234.

The method is as follows:

1. Tissues fixed in 10 per cent neutral formaldehyd.
2. Embed in paraffin.
3. Cut, and mount sections on cover glasses with albumin fixative.
4. Remove paraffin (xylene, alcohol, water).

5. Rinse cover glass with section in 2 per cent silver nitrate; cover wet section with another perfectly clean cover glass, so that they are held together by capillary attraction; then place them carefully in a bottle of 2 per cent silver nitrate and place in incubator for from thirty minutes to one hour; then remove from the silver nitrate and separate cover glasses.

6. Place cover glass with section in this reducing mixture:

	cc.
Two per cent. silver nitrate solution	3
Warm glycerin	5
Warm 10 per cent aqueous gelatin solution	5
Warm 1.5 per cent agar suspension	5
Five per cent aqueous hydroquinone solution	2

7. After the section is reduced, remove and rinse in 5 per cent sodium thiosulphate (hyposulphite) solution.

8. Rinse in distilled water.

9. Absolute alcohol, xylene, balsam.—P. G. H.

857. Improved Technic for the Micro or Little Plate Method of Counting Bacteria in Milk. W. D. Frost. J. Infect. Dis., Chicago, 1921, **28**, 176–184.

A further modification of Frost's micro or slide methods of determining bacterial count of milk is described.—L. C. H.

858. The Characteristics of the Microcolonies of Some Pathogenic Cocci. R. C. Haner and W. D. Frost. J. Infect. Dis., Chicago, 1921, **28**, 270–274.

Small "plates" made on sterile glass slides were inoculated with small amounts of cultures of the staphylococci, streptococci, and pneumococci. The media used were drops of semi-solid milk-agar or serum-agar. The slides were incubated for 4 hours, then dried rapidly on a hot plate, and stained with a mixture made of thionin blue, 1 gm.; phenol, 2.5 gm.; distilled water, 400 gm.; and glacial acetic acid, 20 cc.

These small colonies have distinct characteristics, photographic illustrations of which are given in the paper. The colonies of staphylococci have compact centers, those of the streptococci are more reticulated, being composed of interlacing chains of cocci. The micro-colonies of the pneumococci are small and open, with the cocci arranged in a free and distributed manner.—S. B-J.

859. Preliminary Note on the Use of Some Mixed Buffer Materials for Regulating the Hydrogen Ion Concentrations of Culture Media and of Standard Buffer Solutions. M. R. Meacham, J. H. Hopfield and S. F. Acree. J. Bact., Balt., 1920, **5**, 491–499.

The authors have presented some progress notes in preliminary form on the use of a single solution of possibly 2 to 3 acids giving a smooth curve relation between hydrogen ion concentrations from $10^{-1}/10^{-14}$ (pH 1 to 14) and the amounts of alkali added to this solution mixture of acids. The advantages of such a "single" solution over the usual sets which are in use is evident. The values of asparaginic and phosphoric acid mixtures are discussed and their possibilities indicated from their peculiar ionization constants. Several phases of these problems are being studied and the authors express the hope that other investigators will leave this field to them for a reasonable time so that they will have an opportunity to complete their undertakings before publishing their results in detail.—I. S. F.

860. Die Bestimmung der Wasserstoffzahl durch Indikatoren. (The Determination of pH with Indicators.) L. Michaelis. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1238–1239.

The method depends on the use of single colored indicators, standard buffers being eliminated. Those recommended are: α-dinitrophenol (pH range 1.7–4.4), α-dinitrophenol (2.0–4.7), p-nitrophenol (4.7–7.9), m-nitrophenol (6.3–9.0), phenolphthalein, (8.5–10.5) and m-nitrobenzolazosalicylic acid (10.0–12.0). The temperature and dissociation (color intensity) values are given in tables, thus simplifying the method. Protein and salt errors of these indicators are low. An accuracy of 0.05 is easily obtained in colorless solutions, and of 0.10 in colored ones. The method is recommended for biological fluids.—B. C.

861. A Study of the Variations in Hydrogen-Ion Concentration of Broth Media. Laurence F. Foster and Samuel B. Randall. J. Bact., Balt., 1921, **6**, 143–160.

Beef infusion, beef extract, and "bacto-beef" broths adjusted to pH values ranging from 5.0 to 9.0 undergo changes in acidity upon autoclaving. The largest changes occur in the most alkaline, less in the most acid and least in the neutral solutions. The change in pH ranges usually between 0.2 and 0.4. Only occasionally do the solutions become more alkaline; usually they become more acid. The observable changes in acidity following autoclaving vary in different batches of media of the same composition. Changes of the same kind occur in autoclaved broths upon standing at temperatures between 10° and 37°C. In an atmosphere of CO_2 broth tends to become more acid. The tendency is for the pH to approach a value of about 5.3, regardless of the initial pH. Increases in pH in broth adjusted to various levels of pH and kept standing appear in a CO_2-free atmosphere as well as in the ordinary laboratory atmosphere. Reaction changes in media of pH 5.2 to 9.2 appear to be independent of changes in formol-titrating nitrogen.—I. S. F.

862. Powdered Litmus Milk. A Product of Constant Quality and Color Which Can Be Made in Any Laboratory. HERBERT W. HAMILTON. J. Bact., Balt., 1921, **6**, 43–44.

The author describes the preparation of litmus milk from azolitmin and dried-milk powder. The azolitmin may be obtained from certain dealers or by extraction from litmus cubes (method given here); the milk powder is the ordinary commercial preparation. The medium may be sterilized in the Arnold sterilizer or in an autoclave. It is constant in composition and possesses no interfering color. The dry litmus-milk powder may be kept indefinitely.—I. S. F.

863. Zur Tuberkelbazillenfärbung. (Staining of Tubercle Bacilli.) H. SCHULTE-TIGGES. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1225.

The method is a modification of the Konrich technic. Stain for ½ to 2 minutes in hot carbol-fuchsin (or 24 hours cold). Rinse with water. Decolorize with 10 per cent aqueous sodium sulfite solution (the solution must be made freshly every 2 or 3 days). Rinse with water. Counterstain with a concentrated aqueous solution of picric acid for 5 to 10 seconds. —B. C.

864. Intravenous Administration to Mice, Rats and Guinea Pigs. GEORGE B. ROTH. Pub. Health Rep., Wash., 1921, **36**, 661–665.

A precise method for the intravenous inoculation of small laboratory animals is described. The method is of importance for the reason that it is now employed in this country for the official biological standardization of arsphenamine and allied compounds.—I. A. B.

865. Time Saving Bacteriological Apparatus. M. J. PRUCHA AND F. W. TANNER. J. Bact., Balt., 1920, **5**, 559–563.

The authors recommend the following pieces of apparatus which have been found to be very valuable in the bacteriological laboratory: a double-walled, steam jacketed, trunnion kettle for the cooking of media; a large "hotel size" gas oven for sterilizing with hot air; a super-centrifuge for clarifying media; and a motor-driven apparatus for cleaning test tubes, bottles, etc. The pieces of apparatus are illustrated.—I. S. F.

866. A Simple Shaking Device. J. B. BAUMBERGER. J. Lab. & Clin. M., St. Louis, 1921, **6**, 200.

A description of an impromptu shaking machine which the author has found very satisfactory—F. W. H.

867. Micro-Technique. Suggestions for Methods and Apparatus. N. A. COBB. Tr. Am. Micr. Soc., Menasha, 1920, **39**, 231–242.

The paper describes (1) a method for systematically examining large series of microscopic objects, (2) an object support for freezing microtome, (3) a method of obtaining an end view of a nema, rotifer, or other similar small object, (4) a method for destaining of nemas or other small objects in the differentiator, and (5) a compressorium for chromosomes.—J. H. B.

INDUSTRIAL BACTERIOLOGY

(See also Number 1040)

868. The Leather Industry. J. A. WILSON. Sc. & Indust., Australia, 1920, **2**, 659–667.

Although the author writes this article mainly from the chemical viewpoint the microbiological processes and problems are discussed.—Z. N. W.

MYCOLOGY

(See also Numbers 961, 986, 987, 989)

869. Higher Basidiomycetes from the Philippines and their Hosts. III. OTTO A. REINKING. Philippine J. Sc., Manila, 1920, **16**, 527–537; **17**, 363–374.

A continuation of work reported previously in this journal.—M. W. C.

SOIL BACTERIOLOGY

870. Effect of Seasonal Conditions and Soil Treatment on Bacteria and Molds in Soil. P. E. BROWN AND W. V. HALVERSEN. Iowa Agric. Exper. Sta., Res. Bull. 56, 1921, 251–278.

A study was made of the bacteria and molds in 6 soils, receiving different treatments, throughout a complete year. The primary object of the work was to learn more about the little understood action of molds in soil, but the comparative studies also led to some significant findings concerning the soil bacteria. The 6 plots of soil (a Carrington loam) were treated as follows: (1) continuous timothy meadow; (2) 2.8 tons peat annually; (3) 8 tons manure once every 4 years; (4) 8 tons clover once every 4 years; (5) 2 tons timothy annually; (6) check. These plots were all kept fallow except the timothy meadow plot on which the crop was cut and allowed to remain on the ground.

The bacteria decreased in the late fall with a drop in temperature until the ground became frozen; when frozen the bacteria rose with decreased temperatures and fell with higher temperatures, regardless of the moisture content. Upon thawing, the number of bacteria in soil at first decreased, but then increased with increasing temperature until a maximum was reached, in most cases, in June. There were two maximum counts during the year, February and June, with intervening minimum counts. Bacterial development during summer and early fall did not parallel either moisture or temperature.

The number of molds present in the soils fluctuated from one sampling to the next but was apparently unaffected by moisture, temperature or soil treatment. The number of molds present ranged from 42,000 to 131,000 per gram of soil. The number generally amounted to one-fortieth to one-fiftieth of the bacteria present, but there was apparently no relation between the bacteria and the molds present in the soil. Active mold growth in normally cultivated soils was demonstrated.—J. M. S.

871. Some Soil Fumigation Experiments with Paradichlorobenzene for the Control of the Peach-tree Borer, Sanninoida exitiosa, Say. A. H. Peterson. Soil Sc., Balt., 1921, **11**, 305-319.

The purpose of this investigation has been adequately stated in the title. The method of procedure was to expose the trees to the gas under varying conditions. The results are suggestive and recommended for trial. In the main they are in agreement with those of Blackeslee. Paradichlorobenzene is not a fool-proof remedy. Three-fourths to one oz.will kill 90 to 100 per cent of the borers if the soil temperature is 55 to 60° F. or higher; and the soil is not too wet. Smaller applications are insufficient. Trees 6 years or older are not injured while younger trees often become injured superficially. This may be alleviated by short exposures. The author believes that it is more important to kill the small rather than the large larvae.

The time of application has been studied and it was found that trees receiving two summer treatments or one late summer treatment were free from borers, while one early summer treatment was inadequate. Early spring treatments are undesirable because the soil temperature is too low.

The following method of application is recommended: Finely divided crystals are evenly distributed in an continuous circular band on smooth ground around the base of the tree about 2 inches away. No crystals should be nearer than 1 inch. In case there are indications of borers in the tree 1 to 6 inches above ground the best results are obtained if the soil is mounded about the tree so that the upper level of the soil is even with the highest point at which the gum is exuding. The application should be made on the new soil level. After the paradichlorobenzene is properly distributed, place several shovels of dirt free from extraneous matter over the "death ring.' of crystals and pack down well. For New Jersey the best time of the year to make applications is during the last week in August, or the first 10 days in September. Soil texture or reaction have little influence, while the amount of moisture is in direct ratio to the rate of evaporation of the paradichlorobenzene. The same is true of temperatures below 55° F., the effectiveness of paradichlorobenzene being greatly reduced particularly in short exposures. The average cost of paradichlorobenzene for such treatment is 3 to 4 cents per tree.—N. K.

PLANT PATHOLOGY

872. Über die Biologie des Bacillus carotovorus (Jones). (The Biology of Bacillus carotovorus Jones.) M. Eisler and L. Portheim. Centralbl. f. Bakeriol., etc., Jena, 2. Abt., 1921, **53**, 7-33.

Bacillus carotovorus cultivated for many years upon agar did not cause any infection when inoculated upon raw roots of *Daucus carota.* The organism became virulent again when grown first upon cooked roots, then on roots heated to 56°C, then on raw roots. The agar strain did not develop regularly on the sap of cooked yellow beets, this depending on the concentration and acidity, while the virulent strain grew well under those conditions. The virulence of the agar strain is expressed by its ability to withstand acid concentrations, at which the original agar strain could not develop, and also in certain fermentative reactions. The appearance of the virulent and saprophytic strains shows distinct differences.—S. A. W.

873. Fireblight, Bacteriological History in New Zealand. R. Waters. N. Zealand J. Agric., 1921, **22**, 143-145.

A few of the general characters of *Bacillus amylovorus* are given and its relation to the disease "fireblight" discussed. Cultures from various sources were compared. The susceptible hosts are enumerated.—G. J. H.

874. Action of Some Fungicides on the Citrus-Canker Organism. A Progress Report. H. Atherton Lee. Philippine J. Sc., Manila, 1920, **17**, 325-341.

The method of Anderson and McClintic for determining the phenol coefficient of disinfectants was used.

A list of the disinfectants and the dilution which killed a 3-day culture of *Pseudomonas citri* after 2½ minutes' exposure is given below.

Phenol	1:100
$HgCl_2$	1:20000
Liquor cresolis compositus	1:300
Formalin	1:20

Commercial Mixtures

Liquor cresolis compositus and kerosene	1:50
Lime Sulphur, 32° Beaumé	1:1000
$CuSO_4$	1:200
Neutral Bordeaux mixture	No bactericidal value
Bordeaux 4–4–50	Doubtful bactericidal value
Bordeaux 4–6–50	1:5
Lime, when slaked	1:1000
Burgundy 3–3–50	Little bactericidal value
Burgundy 3–4–50	Little bactericidal value

The author suggests that for disinfection of clothing, $HgCl_2$ 1:2000 is most effective and cheapest; for spraying exposed trees $HgCl_2$ 1:5000 or 1:10000, or commercial unslaked lime 1:500. As to fungicide, which is effective against other diseases and insects, Bordeaux 4–6–50 is recommended. As a contact insecticide and fungicide, lime sulphur is effective. Copper precipitate sprays are valueless as bactericides unless lime is added in excess.—M. W. C.

DAIRY BACTERIOLOGY

(*See also Numbers 850, 928*)

875. *Bactericidal Inhibition: I. Germicidal Action in Milk.* WILLIAM H. CHAMBERS. J. Bact., Balt., 1920, **5**, 527–541.

The confusion existing in the literature on the alleged germicidal action of fresh milk is probably associated with the specificity of this action for certain organisms and with variations in the bactericidal properties of milks from different cows. Microscopic examinatons and plate counts indicate that only some of the raw milks tested were actually bactericidal. The bactericidal property is destroyed by heating the milk to 80-90°C. for two minutes. Its specificity applies to bacterial species also. (*Bact. coli*, *Bact. lactis-acidi*, and a culture R were tested in these experiments.) The properties of agglutinating and of inhibiting development of bacteria bear no common relation to each other, except that both are thermolabile. —I. S. F.

876. *Ein neuer Apparat zur Feststellung des Katalasegehaltes der Milch.* (*A New Apparatus for Determining the Catalase Content of Milk.*) A. MACHENS AND FR. CORDES. Milchwirt. Zent., Hannover, 1921, **50**, 25–27.

The apparatus consists of two flasks connected at the shoulder by a tube passing through a 3-way stopcock. The second flask has a tubular connection at the bottom in which is fitted a vertical graduated tube. The milk to be examined is measured into the first flask and the second filled with water until it stands at the O mark in the graduated tube. The flasks are then closed with rubber stoppers and the apparatus held in the incubator with both flasks open to the air through the stopcock. When the apparatus has come to the temperature of the incubator the stopcock is closed and H_2O_2 added to the milk. The gas evolved passes from the first flask to the second and the volume is measured by the rise of water in the graduated tube. If more gas is given off than can be measured, the stopcock may be turned so that the gas escapes from the second flask until the water is again at the zero mark.—L. A. R.

877. *Hot Air Sterilization of Dairy Utensils.* S. H. AYERS AND C. S. MUDGE. Creamery & Milk Plant Month., 1921, **10**, No. 5, 43–46.

A discussion of the sterilization of dairy utensils with dry heat using the term 'sterile' to denote, not absolute sterility, but the elimination of all non-spore-forming types commonly found on dairy utensils. These include the organisms usually killed with heat of 212°F.

Cultures of different types were used and subjected to various procedures and temperatures. The most efficient method was found to be sterilization with hot air at 284° F. for 4 minutes and the heat held for 2 minutes before cooling. The use of such methods the authors think practical in dairies where facilities are present for the holding after the heating.—G. J. H.

878. *Elimination of Germs from Dairy Untensils.* M. J. PRUCHA AND H. A. HARDING. Creamery & Milk Plant Month., 1921, **10**, No. 5, 41–42.

Already reported from another source; see Vol. 4, Abstract No. 2022.—G. J. H.

879. *Wegweiser fur die Milchwirtschaft, XII, Bakterien, Hefepilze und Schimmelpilze im Milchwirtschafts und Molkereibetriebe.* (*Guide for the Dairy, XII, Bacteria, Yeasts and Molds in Dairying and Dairy Manufacturing*). W. WINKLER. Milchshaft Ztsch., Wien, 1920, **27**, 137–139; 145–148; 153–156; 161; 170–171; 1921, **28**, 3–4; 9–10.

This is a section of a series of papers on dairying and discusses in a popular way the nature and types of bacteria, their occurrence and multiplication in milk, and the effect of their growth on the milk and its products.—L. A. R.

880. *The Laboratory as an Aid to Milk Quality.* G. K. COOKE. Creamery & Milk Plant Month., 1921, **10**, No. 2, 33–35.

The author discusses the relative importance of laboratory examination and dairy inspection in the control of milk supplies.

He presents the view that neither can serve as a complete control measure without the assistance of the other. The laboratory analysis will demonstrate faulty technic by the dairyman that the inspector would be unable to detect with the usual superficial inspection methods. However, if laboratory control only is used, the dairyman fails to get the personal contact and advice of the inspectors.—G. J. H.

881. Estudes sobre la leche que se expende en Guayaquil. (*Studies on the Milk Used in Guayaquil.*) C. D. ANDRADE. Bol. d. Lab. Municip. de Guayaquil, 1920, **1**, 85–95.
The author gives a general discussion of the economic value of milk, the poor hygienic conditions existing in Guayaquil with relation to the milk supply, and finally the method of approaching the problem. Because of low finances the municipal laboratory was obliged even to restrict the number of samples. Of 100 samples taken at random and examined at the Comisaria Municipal, 22 were disqualified. In Ecuador, since colonial times, milk is boiled in the homes. The author blames conditions upon the ignorance of the producer and vendor and lack of competent, well-paid sanitary officials. The Municipal Government should provide milk plants, centralize salt, extend educational work, enforce pasteurization, routine laboratory examination, inspection and supervision of transport and sale.—E. E. E.

882. Contribucion al Estudio de los Métodos para determinar la Adición de aguaa á la leche. (*Contribution to the Study of Methods of the Determination of the Addition of Water to Milk.*) J. GOLDAN, JR. Bol. d. Lab. Municip. de Guayaquil, 1920, 1, 105.
The work described here is an abstract of a paper presented before the Chemical Congress of Argentina. A short summary of various methods is given. The author comes to the following conclusions:

Duclaux constant cannot be used as a true constant of pure milk because it varies between 9 (minimum) and close to 11 (maximum). His conclusions are based on 7000 samples. The corrected fat-free extract is more rational. Again it is not a true constant, varying between 9 and 11.36 The simplified molecular coefficient (Mathieu and Ferre) is better and characteristic for pure milk. It varies between 70 and 82, 74 being the average. In 286 analyses, one was found to give 78, two 79, one 80 and two 82. This coefficient is of yet better value for the determination of water addition if it is accompanied by the corrected fat-free extract value.—E. E. E.

883. Bacteria Concerned in the Ripening of Corn Silage. P. G. HEINEMAN AND CHARLES R. HIXSON. J. Bact., Balt., 1921, **6**, 45–51.
Bacteriological analyses of silage taken through a period of 7 months have led the authors to present the tentative hypothesis that the ripening of corn silage is brought about by 3 groups of bacteria predominating in 3 different phases of the process. The first phase is of short duration and is a fermentative one dominated by organisms of the colon-aerogenes group. The second is carried on by streptococci and is accompanied by moderate acid formation. The third phase is dominated by lactobacilli, probably by several different strains. Although yeast cells are invariably present they were never considered to be in growth stages or to be taking any active part in the ripening process. The 3 phases are in no sense considered to be sharply defined. They probably are catenary.—I. S. F.

COMPARATIVE PATHOLOGY

(*See also Numbers 937, 1003, 1024, 1042*)

884. The Pathology of Epidemic Pneumonia in Mice and Guinea Pigs. J. J. KEEGAN. Arch. Int. Med., Chicago, 1920, **26**, 570–593.
The epidemic occurring among the stock laboratory animals was evidently caused by the *Bacillus bronchisepticus*. The author divides the epidemic into the following stages; (a) nasopharyngeal infection (distemper), (b) mild bronchitis, (c) purulent bronchitis, (d) infundibular pneumonitis, (e) lobular pneumonia, (f) diffuse serohemorrhagic pneumonia, (g) subsidence in less distinct reverse order. The author draws attention to the fact that the same stages occurred in the epidemics of streptococcus pneumonia and influenza.—G. H. R.

885. The Value of the Intrapalpebral Mallein Test in the Diagnosis of Glanders. EDWARD H. MASON AND R. V. B. EMMONS, J. Immunol., Balt. & Cambridge, Eng., 1920, **5**, 489–497.
The study was undertaken to answer the question as to whether doubtful or suspicious intrapalpebral mallein reactions in horses are confirmed by serological findings. The facts from a study of 94 horses and 8 mules which had given slight but not definite diagnostic intrapalpebral mallein reactions seem to indicate that the complement fixation reaction is of the greatest value. It was positive in 75 per cent of the 94 horses examined. Agglutination ranks second, confirming a suspicious mallein test with a definitely positive reaction in 44 per cent of the cases in the same series.—R. R. H.

886. Immunization with Blackleg Aggressin. THOS. P. HASLAM. J. Immunol., Balt. & Cambridge, Eng., 1920, **5**, 539–546.
A liver-brain-peptone medium is described which is more sensitive than guinea pigs for detecting the presence of *B. chauvoei* in blackleg aggressin.

Grind liver, add one liter of water to each 500 grams of liver. Bring to a boil slowly and cook about 30 minutes or until the liquid is clear. Pour off the clear broth, add 1 per cent peptone and 0.5 per cent salt, adjust to pH 8, and it is ready to combine with the brain. Grind the brain, using the coarse grinder, and cook at 3 pounds pressure about one and one-half hours. Fill flasks three-fourths full with mixture of brain tissue and liver broth, and autoclave at 6 pounds for 3 hours.

In calves as in guinea pigs the result of an immunity test will depend upon the amount of aggressin given, and the size of dose and the potency of the virus used in testing. For detecting degrees of difference in aggressin, experiments were carried out in which the virus given was strong enough to cause a marked reaction in the protected calves. Under these conditions 74 per cent of calves receiving 5 cc. of blackleg aggressin were immune to 5 cc. of pure culture virus. It is estimated that blackleg aggressin has been used on five million calves in the last 3 years and the field results have been highly satisfactory.—R. R. H.

887. *A Study of an Organism from Nephritis in Sheep.* C. P. FITCH AND D. C. BEAVER. J. Infect. Dis., Chicago, 1921, **28**, 345–351.

An organism, apparently closely related to *B. nephritidis equi*, which causes nephritis, joint infections, etc., in horses, has been described by the authors as the cause of nephritis in sheep. The morphologic and cultural characteristics are described. Although closely related to the similar organism causing ephritis of horses it presents sufficient differences to constitute a new species or variety.—L. C. H.

888. *Avian Botulism (Type A) or Limber Neck.* ROBERT GRAHAM AND HERMAN SCHWARZE. J. Infect. Dis., Chicago, 1921, **28**, 317–322.

It is shown by the authors that limber neck of chickens, at least in certain localities, is true botulism. Chickens fed with food contaminated with botulinus spores (Type A) come down with limber neck and the spores can be recovered from their feces. Type B spores proved non-infectious for chickens yet these spores could be recovered from the feces of the chickens to which they were fed and food mixed with such feces and fed to susceptible animals cause botulism. The authors cite the analogous instance of mature swine and cattle being resistant to Type B although the virus is found in their excreta. The question is raised of animal carriers and reservoirs for infection.—L. C. H.

PARASITIC DISEASES

(*See also Number 939*)

889. *Effects of Secretions of Certain Parasitic Nematodes on Coagulation of Blood.* BENJAMIN SCHWARTZ. J. Parasitol., Urbana, Ill., 1921, 7, 144–150.

Among the toxic products elaborated by some nematodes, especially some members of the family Strongylidae, substances that retard coagulation of the blood have been found in certain species. An extensive series of experiments along this line undertaken by the author are summarised as follows:

1. The substance in species of *Strongylus* that inhibits coagulation of blood is present in the posterior as well as in the anterior portion of the worms.

2. *Bustomum phlebotomum*, a hookworm parasitic in cattle, contains a substance soluble in salt solution that inhibits coagulation of blood for considerable periods which vary with different samples of blood. A closely related species *Bustomum trigonocephalum*, contains a similar anticoagulin.

3. Salt solution extracts of *Haemonchus contortus* cause but a slight delay in coagulation of blood. Extracts of *Syngamus trachealis, Dictyocaulus filaria*, and *Stephanurus dentatus* do not retard coagulation of sheep blood. Extracts of *Oesophagostomum columbianum* do not retard coagulation of rabbits' blood.

4. The body fluid of *Ascaris lumbricoides* inhibits coagulation of blood to a moderate extent. Extracts of *Ascaris equorum* and of *Belascaris* sp. have a slight effect on coagulation of sheep's blood.

5. The body fluid of *Ascaris lumbricoides* inhibits coagulation of blood to a moderate extent. Extracts of *Ascaris equorum* and of *Belascaris* sp. have a slight effect on coagulation of sheep's blood.

6. In view of the fact that the delay in coagulation of blood due to extracts of nematodes occurs *in vitro*, that it varies with extracts of different species of worms, and that extracts of certain species produce no delay in coagulation, it may be concluded that specific substances, other than proteins in solution, must be involved.

7. The substances in question appear to be physiologically related to hirudin and snake venom, and like the latter are probably part of a complex of toxic principles.

8. So far as present knowledge goes, nematodes which contain substances that inhibit coagulation of blood to a marked degree are zoologically related, belonging to the family Strongylidae, the members of which have a buccal capsule adapted to lacerating the intestinal mucosa.

9. That the injection of their secretions into the intestinal mucosa, by certain biting nematodes, resulting in minute hemorrhages, is of etiological importance in nematode diseases appears very probable.—W. A. R.

890. A New Amphibian Cestode. L. B. DICKEY. J. Parasitol., Urbana, Ill., 1921, **7**, 129–136.

Tapeworms collected at Oxford, Ga. from two host specimens of *Bufo lentigenosus* proved generically distinct from any previously described, and are described as *Distoichometra bufonis*.

The new genus is characterized as follows: Scolex unarmed without rostellum. Body generally circular in cross-section, or nearly so. Genital pores alternating irregularly. Testes two in number, dorsal. Cirrus pouch approximately one and one-half times as long as broad. Ovary ventral. Uterus horseshoe-shaped, breaking up early into two parallel rows of egg capsules, 4 to 6 in a row. Capsules hold 3 to 6 eggs each. Adult specimens of the new specie *D. bufonis* measured 100 mm. in length, the last few proglottids being 0.18 to 0.24 mm. in diameter.—W. A. R.

891. Ein Cysticercus (tenuicollis?) im Kleinhirn. (A cysticercus (tennicollis?) in the Cerebellum.) MAX HAUSMANN. Schweiz. med Wchnschr., 1920, No. 49, 1105–1110.

A case report is given, including a presentation of the clinical picture, the autopsy findings, the question of diagnosis, and the identification of the parasite. Involvement of the nervous system by this parasite is not common.—G. H. S.

892. Zur Ascariden-Einwanderung in die Leber unde die Bauchspeicheldrüse. (The Migration of the Ascarids into the Liver and the Gastric Juice.) D. EBERLE. Schweiz. med. Wchnschr., 1920, No. 49, 1110–1112.

A series of case reports.—G. H. S.

TROPICAL DISEASES

(*See also Number 996*)

893. Report of Conference of Sleeping Sickness. SEC. OF PUB. HEALTH. Med. J. S. Africa, Johannesb., 1920, **15**, 227–231.

The conference was called because of the desire to open certain parts of South Africa in the fly belt for the recruiting of native labor.

Information is given upon the varieties of *Glossina* found, their distribution, varieties capable of transmitting sleeping sickness; also varieties of trypanosomes found in animals in this area. Public health measures necessary to prevent the spread of the disease over routes of travel were suggested.—C. P. B.

894. Malarial Research in South Africa. EDITOR. Med. J. S. Africa, Johannesb., 1920, **15**, 172–173.

This is the summary of a report prepared for the War Office by the South African Medical Corps, through the Director of the Medical Service. Using the Ross thick smear method 74,022 specimens from 18,731 cases were examined. Of these 8788 were positive; 61.3 per cent benign tertian, 22.5 per cent malignant subtertian, 16.2 per cent mixed of these two types.

A daily increase of quinine of from 22 grains to 27 grains was associated with a fall in the average period in hospital from 70 to 46 days, and a reduction in the percentage of relapses. A rise in the daily dosage of quinine of from 18 grains to 27 grains showed a reduction in the percentage of cases giving positive blood smears on re-examination after an 8-day interval, from 29 per cent to 19 per cent.

The relapses which occur during treatment with an average dose of quinine of 20 grains indicate clearly that prophylaxis with the usual dosage (5 gr. daily) is quite insufficient for troops already infected but not actually suffering from an attack.

The daily dosage of quinine in malaria is very definitely limited in amount, owing to the toxicity of this drug. Moreover, investigation has shown that the exhibition of large daily doses of quinine in order to effect Ehrlich's *Therapia sterilisans magna* is unsuccessful in preventing relapses and eradicating malaria. The plan of treatment recommended is, therefore, 30 grains daily for 3 weeks, followed by 20 grains daily for 1 month, and subsequently 10 grains daily for 2 months. Relapses are treated in a similar manner until the infection is controlled and in the course of time finally eradicated.

The importance of the patient's own defensive mechanism, largely represented by phagocytosis, was brought out clearly, as progress is not made until this has been restored by rest in bed, good food, and tonics—especially iron and arsenic.

Quinine prophylaxis was unsuccessful in preventing malarial infection in the German East African Campaign.

Treatment by various means and with different drugs is discussed. Arsphenamin exerted a marked parasiticidal action on the benign tertian parasite, but none on the malignant tertian, but the latter were rendered more vulnerable to the action of quinine. Soamin exerted the same influence.

The Wassermann test is discussed with the conclusion that "There is no evidence that the blood at any time in benign tertian, malignant tertian, or mixed infection (M.T. and B.T.) uncomplicated by latent syphilis gives a positive Wassermann reaction."—C. P. B.

895. *Studies on the Various Types of Malarial Infection and the Effect of Quinine Treatment Thereon Among the Native Population of the Malay Archipelago.* N. H. Swellengrebel and J. M. H. Swellengrebel de Graff. Ann. Trop. M. & Parasitol, Liverp., 1920, **14**, 41.

Malaria was found to be endemic in certain areas of the Malay Archipelago while other areas were occasionally visited by epidemics, especially during the dry season. Three types of malarial infection are present, tertian, quartan, and subtertian. In endemic areas as a rule only the children are found to be harboring the gametes of the malarial organisms and are therefore the only infective carriers, while in epidemic regions not only the children but also the adults are the infective gamete reservoirs.

The effects of quininisation among the population is these two different areas appear to be, that in the epidemic regions the nature of the parasite infection seemed to tend toward the endemic type, i.e. the adults in whom gametes were found became less in number. The chances of infection therefore were also reduced in these regions. In endemic areas, the effect of quininisation could not be ascertained except in certain districts on account of the fact that the children do not respond to treatment like the adults as they require most favorable conditions such as immediate attention as soon as a febrile attack appears, etc. and unless such favorable conditions are present general quininisation among children seems hopeless.—W. C. B.

896. *I. Oral Administration of Quinine and Arsenic for Short Periods to Young Native Children with Malignant Tertian Malaria.* J. W. S. Macfie and M. W. Fraser. Ann. Trop. M. & Parasitol., Liverp., 1920, **14**, 83.

In two groups of children whose ages ranged from less than a year to 7 years, infected with malignant tertian malaria, quinine hydrochloride and quinine sulphate was administered orally in 10 grain doses from 2 to 13 consecutive days. The effect in general of these 2 forms of quinine was similar in that most of the cases did not become negative or a parasitic relapse occurred some days later. The persons in group C who received 20 grains of quinine sulphate orally per day for 5 to 17 consecutive days fared no better from the treatment than those in the first two groups. A mixture containing 10 grains of quinine hydrochloride and 5 minims of *liquor arsenici hydrochloridi* was given in 5 cases but it had no beneficial effects.

The quinine treatment prevented febrile attacks during the course of treatment but it did not always rid the patient of the malarial parasites. Blood examinations should therefore be made as a control in malarial treatments to determine whether or not the parasites have disappeared. It was noticed that native children might harbor the parasites for several consecutive weeks without being troubled with febrile attacks.—W. C. B.

897. *Notes and Comments Upon my Malarial Experiences while with the Egyptian Expeditionary Forces, 1916–1918.* H. M. Woodcock. J. Roy. Army Med. Corps, Lond., 1920, **34**, 471.

Malignant tertian infections among British troops in Macedonia and Palestine while more severe clinically than similar type infections encountered elsewhere, are not believed to be due to a different strain, but rather (1) to the heaviness of the infection caused by repeated inoculation from infected mosquitoes, and (2) the susceptibility of the unaccustomed human host. Intravenous administration of quinine is the most desirable method of treatment. —W. P. B.

898. *Relapsing and Mianeh Fever in East Persia.* C. T. H. H. Harold. J. Roy. Army Med. Corps, Lond., 1920, **34**, 484.

Indian relapsing fever, which is lice borne, was encountered generally among the Indian troops, while the Persion or Mianeh Fever was limited to those that had been in the district about Mianeh. This latter disease resembles African relapsing fever in that it is tick borne, and presents an irregular fever curve with short intermissions. The incubation period is 1 to 12 days; the fever attack averages 3 days with marked remissions. An intermission of 2 days is followed by a relapse lasting 12 to 24 hours. Seven relapses, lasting in all about 42 days were witnessed. Neosalvarsan was administered with success. The spirochetes are few in number, and are best found by use of the thick drop method. They are longer and coarser than the spirochete of the Indian variety, and the spirals are deeper and more regular. They are in length comparable with the African variety, but differentiated from it by possessing deeper, more regular spirals.—W. P. B.

899. *The Prophylaxis of Malaria in Dar-es-Salaam, East Africa.* A. W. J. Pomeroy. J. Roy. Army Med. Corps, Lond., 1920, **35**, 44.

The Germans had previously relied on the compulsory administration of quinine as the sole method of prophylaxis in this malarious district. This method was a failure. The British authorities carried out the general scheme of prophylaxis after Ross's methods: elimination of all stagnant water (illustrated), use of oil and chemical larvicides, and the introduction of enemy fish; the other methods were impractical.—W. P. B.

MEDICAL ENTOMOLOGY

900. *Heat and Stegomyia fasciata: Short Exposures to Raised Temperatures.* J. W. S. Macfie. Ann. Trop. M. & Parasitol., Liverp., 1920, 14, 73–82.

Eggs fresh and moist or preserved dry for 2 weeks, were immersed in water at various temperatures for 5 minutes: they were generally killed at 46°C., and always killed at 49°C.

Eggs exposed to dry heat for 5 minutes were always killed at 49°C., and generally at 47°C.; 45°C. had no effect on them.

Larvae immersed in water for 5 minutes were generally killed at 43°C., and always killed at 47°C.; they suffered no permanent effect from temperatures below 42°C.

Pupae immersed in water for 5 minutes were generally killed at 45°C., and always killed at 50°C.; they seldom suffered any permanent effects from temperatures below 44°C.

Fasting and fed adult mosquitoes were enclosed in a flask, with a drop of water and a layer of lint in the bottom, and a thermometer through a plug of wool in the neck of the flask. The flask was immersed in a water bath until the thermometer registered the desired temperature, and that temperature was maintained for 5 minutes. No mosquitoes recovered after exposure to a temperature of 44°C. for 5 minutes; and they seldom recovered after exposure to a temperature of 43°C. for 5 minutes. The heating appeared to affect the wings particularly, as partly revived mosquitoes could walk, but could not fly, and some were unable to fold the wings.

With no moisture in the flask the mosquitoes were slightly more susceptible to heat than with moisture in the flask.

The author concludes that the ability of *Stegomyia fasciata* to withstand sudden exposure for 5 minutes to a raised temperature is greatest in the egg stage, slightly less in the pupal stage, and least in the larval and adult stages.—E. R. W.

901. *Flytraps and their Operation.* F. C. Bishopp. U. S. Dept. Agric., Farmers Bull. 734, March, 1921, 16 pp.

This is a second revision of a bulletin "intended to give directions for the use of a supplementary means of controlling flies."

Fly traps are valuable (1) by catching flies which come to clean premises from other places which are insanitary and (2) by capturing those flies which invariably escape in greater or less numbers the other means of destruction which may be practiced. To be of the greatest value fly-trapping should begin early in the spring, when the destruction of the comparatively few flies means the prevention of the development of myriads by midsummer.

Detailed directions for the construction of various types of flytraps are given. The best for effective trapping, durability, ease of construction and repair, and cheapness is thought to be the conical hoop trap. It consists essentially of a screen cylinder with a frame made of barrel hoops, in the bottom of which is inserted a screen cone. Four laths nailed to the hoops on the outside trap act as supports between the hoops and the ends are allowed to project 1 inch at the bottom to form legs. The wire cone is 22 inches high and is cut off at its apex to give an aperature 1 inch in diameter.

A mixture of one part of cheap cane molasses with three parts of water is among the most economical and effective baits for the house-fly. The attractiveness becomes marked on the second or third day. On dairy farms probably milk is next choice. The curd from milk with about one-half pound of brown sugar added to each pound, and water to make it thoroughly moist continues attractive for 10 days or more if kept moist.

Tent traps, garbage-can, manure box and window traps are discussed and figured. The care and location of traps, the preparation of sticky-fly papers and the destruction of flies with poisons are also briefly considered.—W. A. R.

PROTOZOOLOGY

902. *An Atypical Amoeba Causing Dysenteric Lesions.* Gopal Chandra Chatterjee. Philippine J. Sc., Manila, 1920, 17, 385–391.

Material obtained at autopsy from a case of an amebic dysentery contained an ameba, differing from others previously described. The essential points of difference of morphology between this ameba and *Entamoeba histolytica* were a massive nucleus, a marked distinction between ectoplasm and endoplasm and the absence of chromidia. The lesions caused by this organism were unique, in that the small intestine was attacked and there was a peculiar peritoneal involvement.

The ameba is described in detail. Three plates are included. The tentative name given is *Entamoeba paradysenteria* sp. nov.—M. W. C.

903. *Measurements of Trypanosoma diemyctyli from Different Hosts, and Their Relation to Specific Identification, Heredity and Environment.* R. W. Hegner. J. Parasitol., Urbana, Ill., 1921, 7, 105–113.

Trypanosoma diemyctyli is a form of special interest in teaching work because of its abundance and the ease with which it may be obtained where its host, *Diemyctylus viridescens*, is available.

[illegible] studies here reported all out of 78 aquatic specimens of this newt were infected and 2 [illegible] and specimens. In none of 5 other species of salamanders were the organisms found. [illegible] experiments on 6 species of salamanders and 2 species of frogs were unsuccessful. [illegible] on in measurements of trypanosomes from different newts are noted. Of 106 tr[illegible] from one newt 100 were uniformly small and 6 were much larger indicating 2 diffe[illegible] in a single host. The different types indicated in specimens from this and differe[illegible] probably races of one species that are heritably diverse in size.—W. A. R.

904. *Micro[illegible] Parasitic in Copepods.* R. Kudo. J. Parasitol., Urbana, Ill., 1921, 7, 137–143.

Two new [illegible]*icrosporidia*, *Nosema cyclopis* nov. spec. parasitic in *Cyclops fuscus*, and *Nosema infirmum* nov. spec. parasitic in *Cyclops albidus* are described. Infection with the latter seems to be fatal to its host.

Though several microsporidia-like parasites have been previously described for Copepods, their microsporidian nature is open to question. The literature relating to them is reviewed. —W. A. R.

905. *A Microsporidian Occurring in the Smelt.* Franz Schrader. J. Parasitol., Urbana, Ill., 1921, 7, 151–153.

A characteristic infestation of smelts is due to a Microsporidian belonging to the genus *Glugea*. Apparently the intestine is the primary seat of the parasite. Affected fish are characterized by the appearance of more or less numerous cysts in the viscera, and generally all the cysts in a fish are of approximately the same size. They may vary from microscopical dimensions to 3 mm. in diameter.

A form, *Glugea hertwigi* Weissenberg, from the European smelt corresponds almost exactly in size and occurrence with the one here described.—W. A. R.

906. *Eutrichomastix lacertae im Blut und in blutsaugenden Milben.* (*Eutrichmastix laceretae in the Blood and in Blood-sucking Mites.*) Edward Reichenow. Centralbl. f. Bakteriol. (etc.), I. Abt., Orig., Jena, 1920, 84, 466–478.

A table is given of the various observations of flagellates usually regarded as intestinal parasites which have been found in the blood. The organism which he describes, *Eutrichomastix lacertae*, was observed in the blood of 2 species of lizards. A study was also made of these organisms taken up by the mite *Liponyssus saurarum*.—R. E. B.

907. *A New Blood Fluke from Turtles.* H. B. Ward. J. Parasitol., Urbana, Ill., 1921, 7, 114–128.

A unique species of fluke inhabiting the circulatory system of turtles in this country is here described under the name *Proparorchis artericola* gen. et spec..nov. It is recorded for *Pseudemys elegans* from Havana, Ill., *Malacoclemmys leseuerii* from Newton, Texas, *Pseudemys scripta* from Raleigh, N. C. and *Chrysemys marginata* from Fairport, Iowa.

The species is of peculiar importance in that it shows a relationship to the blood-inhabiting flukes of man They were never found in the venous circulation but were taken in the arteries and in the heart.

All organs examined contained eggs. In extreme cases the mesentery and lungs are so crowded that the eggs serve to outline the course of the arteries. Those outside of the worm in the blood vessels of the mesentery are in part high-colored and semi-transparent, and in part dark brown and almost opaque. The latter seem to be the older. In size most of the eggs from preserved material come within the limits of 88 to 114 μ in length and 70 to 88 μ in breadth. Those still retained in the body of the worm are smaller than the average of the free egg and are clearly oval while those outside are more nearly spherical. The eggs are operculate without any trace of a spine.

The adult worms which are easily found on careful examination of the mesenteric vessels of infested turtles, are small and conspicuously transparent. Unlike the blood flukes of man they are monoecious. They measure from 1.62 by 0.28 to 2.62 by 0.77 mm. In the smallest the ovary was small and no ovum had yet developed but ripe sperm cells were found in the testes and vesicle.

A single sucker is present at the anterior end. It is elongate-oval and projects forward in a characteristic manner.

The most striking feature is the peculiar development of the reproductive system. The testes are numerous, irregular, lobed, and confined to intercrural area, anterior to the ovarian complex. The ovary is lobed, chiefly on the right side of the body; oviduct short, with sperm-filled expansion; Laurer's canal present. Vitellaria well-developed, conspicuous laterally, enveloping intestinal crura on lateral, dorsal and median aspects throughout entire length. No true uterus; the eggs are deposited so soon that never more than a single one is seen in the fluke.

The new fluke seems closely related to the form from a wood turtle which is the type of the genus *Spirorchis* MacCallum 1919. The two genera the author groups together in the new family Proparorchiidae.—W. A. R.

EPIDEMIOLOGY

(*See also Numbers 974, 1041*)

908. The Hygiene of the Prisoner of War. J. C. McWalter. Pub. Health, Lond., 1921, **34**, 63–67.

The author, a sanitary specialist, presents some interesting facts concerning the German and Turkish prisoners of war and their different needs. The Turk, due to his habit of inducing sleep by inhaling carbon dioxide by wrapping a towel about his head and face, is anemic and "little fit to withstand infection." He is indifferent to death but intolerant of pain and consequently brought permanent injury upon himself and even death by refusing treatment, as was experienced in the high proportion for blindness and mortality among the prisoners at Tel-El-Kebir, from ophthalmia and other curable infections.

The German prisoner introduced fewer problems because of his clean habits and better health, though conflicting standards of hygiene offered one of the greatest difficulties in controlling the detention camps. In one German camp, 3000 officers among the prisoners protested against the prevalent catarrh and bronchitis which they claimed due to too drastic window ventilation; rooms were allowed to be "perfectly closed for over eight hours at a time," although the inhabitants constantly smoked. With 30 feet of floor space and 300 to 500 cubic feet of air, men apparently lived without injury to health under such conditions.

Due to the danger of malarial infection, desert camps were preferred to wooded places in the tropics, in spite of the added difficulties in transportation of commodities. The desert is also more favorable in the facilities offered in isolating cases of typhus, dysentery, and cholera (which were not uncommon) but also favorable to eye troubles.—J. B.

909. Appel du contingent, âge des recrues, date d'appel, mesures hygieniques a prendre dans la selection du contingent. (*Summoning the Contingent, Age of the Recruits, Hygienic Measures for Selecting the Contingent.*) G. H. Lemoine. Rev. d'hyg., Par., 1921, **43**, 59–73.

The minister of war in a letter to the Academy of Medicine, Nov. 14, 1920, asked the following 3 questions: "Of what age is it best to compose the contingent—19 to 20 or 21?" "In what season is it best to organize it?" "Has resistance to fatigue and sickness been among classes under the influence of food restrictions?"

Conscription of men of 21 instead of 20, affected agriculture, commerce, industry and the professions in that young men were ready to enter a future career at the age of 20 and even 19, but delayed because they were unwilling to begin work only to be interrupted at the end of so short a period to be conscripted into the army. Contagious diseases (eruptive fevers, diphtheria, typhoid, etc.) occurred among men of 20 of five classes reported 1907–1911, in no greater degree than among men of 21. In 1920, a group of men of 20 years showed a morbidity of 578 per 1000, while a second group showed a proportion of 525 per 1000. The effects of food restrictions varied in different places, but more deplorable than these restrictions was the physical influence of the development of alcoholism. Of 213 epidemics, 76 occurred among contingents formed in the spring, 59 among those organized in the winter, 48 among those organized in autumn and 30 among those formed in summer. The result of these findings is that they have reverted to conscription of men of 20 as ratified by the Academy in 1913.

The problems of clothing and food have more or less been solved, and the author suggests the following to solve the problems of quarters and illness which are foremost: (1) Careful selection of subjects; (2) choice of irreproachable barracks; (3) allotment of sufficient change of clothing; (4) sufficient and well prepared food; (5) careful physical training. Recognition of the danger of close quarters in the spread of disease, results in almost flawless hospital care. The regiments are split up in the trenches, the groups are limited, thus insuring better attention, beds are separated and infection is held in check. Where there are no facilities for isolation, the contingent is vaccinated.

Tuberculosis offers great difficulty and requires special attention. Beginning in 1885, 122 men were exempted because of pulmonary tuberculosis and chronic bronchitis, the number of exempted men decreasing gradually until in 1909 only 80 were exempted. Of the sick men who were accepted, 4 improved in 1885 and 8.25 improved in 1909. These figures are based on "men per 1000." This demonstrates the old belief that men apparently hopelessly ill can improve under proper treatment.—J. B.

910. The Relation of the Port to Other Sanitary Authorities. W. M. Willoughby. Pub. Health, Lond., 1921, **34**, 79–81.

A brief review summarizing the sanitary problems of ports. The drainage problems are dismissed as "as small as the drains are short." The other main problems concern food or water which "must be rigidly kept separated from excreta and must be of good origin and preservation, twice breathed-in air must be avoided, the beneficent actions of light secured, overcrowding checked, cleanliness inculcated and the segregation of the sick persons insisted on." The main part of the paper gives personal experiences met in ship inspection for smallpox and plague.—J. B.

911. La prophylaxie de la diphterie dans le departement de la Loire. (*The Prophylaxis of Diphtheria in the Loire Section.*) Emeric. Rev. d'hyg., Par., 1921, **43**, 84–89.

A rather popular article places emphasis on the importance of the microscope in diphtheria diagnosis and in the determination of the isolation period.—J. B.

912. Notes on the Epidemiology of Bacillary Dysentery. **Geo. Macleod.** Pub. Health, Lond., 1921, **34**, 81–84.

Epidemics of dysentery in the army in trench life were practically unavoidable due to the easy method of spread, i.e., from fecal matter by flies, contaminated food and soiled hands. At the height of the Somme diarrhea epidemic in 1918, of 1,513 cases, 19 per cent (by rectal swabs on 3 successive days) were shown to have dysentery of the bacillary type, 15 of the 298 positive cases being due to Shiga's bacillus. Difficulties in explaining the origin of an epidemic are thought related to carriers, although "epidemics have not been definitely traced to carriers in the same conclusive way as they have been in the case of enteric fever." In dysentery carriers "it is unusual to find the bacilli in large numbers in the stools for any length of time after the acute phase of the illness and it is probable that in dysentery the bacilli are excreted in large numbers only during or immediately after a mild diarrhea attack by a subject who has previously had the disease. The explanation offered is that the dysentery bacilli penetrate deeply into the intestinal tissues and mesenteric glands, and may be discharged at infrequent intervals, as, for example, following dietetic derangement. Several explosive outbreaks in the war were shown to be due to infected food or water, as, for example, where men drank shell-hole water.

Macleod calls attention to the necessity of investigating summer diarrhea in children which may be true bacillary dysentery from a soldier parent; otherwise there is high probability that dysentery in the civilian population may reach epidemic proportions.—J. B.

913. La desinfection des utensiles de table et des couverts et des verres. (The Disinfection of Table Ware, Dishes and Glasses.) **Broquet.** Rev. d'hyg., Par., 1921, **43**, 90–95.

A general review of the effects of soap, boiling and hot steam on communicable disease organisms transferred by table utensils accepts boiling and steam as the most efficient for metal, china and porcelain, but asks if it is sufficient for such utensils as glasses which are most highly contaminated by saliva.—J. B.

914. Domestic Animals as a Factor in the Spread of Disease. **Wm. G. Savage.** J. Roy. San Inst., Lond., 1921, **41**, 285–291.

The author has devoted years of investigation to the study of the relation of tuberculosis, diphtheria and food poisoning between animal and man, and offers the following results of his work:

Bovine mastitis is caused by a number of different bacteria but the chronic form is usually due to the tubercle bacillus or "less commonly to actinomycosis." The average prevalence of tuberculous udders in cows is about 1 per cent, a potential cause of human tuberculosis. In 1907–1908, of 35 cases of bovine mastitis, over 70 per cent were due to streptococci, over 16 per cent were due to staphylococci, 1 per cent was due to *B. coli*, and the remainder to doubtful bacteria. Thirteen out of 15 strains of human streptococci were unable to produce mastitis in goats although the bovine type is highly virulent for goats. To prove the non-virulence of bovine mastitis for humans, the author infected his own throat with massive fresh doses from a cow. It was difficult to recover the organism and no ill effect resulted. The cow is pathogenic to man only by acting as a carrier of human pathogenic streptococci, (which are hemolytic as opposed to the bovine which are non-hemolytic), and may carry the organism from the milker for weeks. Similar experiments were carried on in Boston during the outbreak in 1917, Brown and Orcutt confirming the foregoing statements.

It is an established fact that food poisoning is mostly caused by the Gaertner group (*B. enteritidis*, *B. suipestifer* or *B. aertrycke*). The Gaertner group does not arise from tainted food but infected food. Few cases show outbreaks from animals suffering from the disease as in Murrow and Limerick, but animal carriers are a source of the disease. It occurs in gastro-enteritis, udder, puerperal sepsis and local abcesses. Not much has been done so far to associate them etiologically.

In the investigation of kittens and cats unassociated with diphtheria, kittens showed no organisms, but 5 out of 8 healthy cats had in their throats bacilli closely resembling the diphtheria organism but which were non-pathogenic. This was also found true in the case of cats associated with human diphtheria. Nineteen experiments in all were carried out with 10 different strains of human diphtheria, 4 of which were fully tested for virulence. With massive, repeated feedings (in which one individual was so fed 11 times) with the highly virulent culture, with swabs from a human throat, scarification and infection, and nose swabbings, it was found impossible to infect or create carriers for even a short period.

The author, therefore, rejects the opinion that cats can suffer from "naturally acquired disease caused by diphtheria bacilli," and concludes that such reports are due to the failure to realize that a large proportion of healthy cats harbor organisms difficult to distinguish from *B. diphtheriæ*.—J. B.

CARRIERS OF INFECTION

(See also Numbers 912, 952, 1022)

915. Two Small Outbreaks of Typhoid Fever Probably Due to a Carrier. **Emerson Megrail, R. G. Perkins and E. R. Miller.** J. Am. M. Ass., Chicago, 1921, **76**, 1001.

Two small outbreaks of typhoid fever were investigated and traced to a carrier. Specimens from stools were examined at some distance from the laboratory.—P. G. H.

916. Diphtheria Carriers and their Treatment with Mercurochrome. Geo. A. Gray and Bertha I. Meyer. J. Infect. Dis., Chicago, 1921, **28**, 323–326.

Owing to the occurrence of a number of cases of diphtheria and the subsequent finding of a large number of healthy carriers, measures were taken at the U. S. Naval Hospital at Mare Island to control the spread of the disease. Of 544 Schick tests made on adults 104 or 19.1 per cent were positive. These persons were given 1000 units of antitoxin and toxin-antitoxin injections were begun. New patients brought to the hospital were taken first to the laboratory where cultures were made and Schick tests done. Stress is laid by the authors on thorough swabbing of the mucosa of the tonsils and nasopharynx. 162 of 680 persons examined were found to harbor diphtheria bacilli—23.8 per cent. The majority of positive cultures were obtained from the nasal passages and the high percentage of positive cultures is believed to be in no small measure due to having the swabs come in contact with all parts of the mucous membranes. As all susceptible persons were immunized it was decided not to isolate the carriers but to make them carrier free as soon as possible. A minimum standard of 3 negative cultures at 48-hour intervals was set to determine the efficacy of the treatment. Mercurochrome—220 was used in aqueous solution in 0.5, 1.0 and 0.2 per cent strength. Of 90 carriers treated 88 cleared with an average of 19.1 treatments or 12.7 days. The other 2 resisted all efforts, one in the tonsillar crypts and the other in the scars of a peritonsillar abscess. A medicine dropper was used in the nose and a swab for the tonsils. The authors feel favorably impressed with the efficacy of the treatment.—L. C. H.

917. Diphtheria Infections, with Particular Reference to Carriers and to Wound Infections with B. diphtheriae. J. S. Simmons, J. T. Wearn and O. B. Williams. J. Infect. Dis., Chicago, 1921, **28**, 327–340.

Between October, 1918, and August, 1919, 75 cases of diphtheria and 102 carriers of diphtheria bacilli were treated in the Walter Reed General Hospital. New cases continued to develop in the hospital each week, in spite of the isolation of all positive contacts and carriers.

The successful treatment of carriers depended not so much on the kind of antiseptic used as on the ability to reach the organism with the antiseptic, or when possible on the complete removal of the focus of infection.

Forty-two per cent of the strains from contact throat carriers and "wound carriers" were virulent, while about 80 per cent of the strains from convalescents and patients whose wounds were infected with *B. diphtheriae* were virulent. Morphological, and cultural reactions gave no indication of the state of virulence of the organisms.—S. B-J.

PUBLIC HEALTH REGULATION

918. A Summary of the Work of the U. S. Interdepartmental Social Hygiene Board, 1919–1920. Thomas A. Storey. Social Hyg., N. Y., 1921, **7**, 59.

A report for the fiscal year, ending June 30, 1920, covering "14,000 cases of venereal diseases reported in the army, 21,000 cases reported in the navy, and 326,000 cases (men, women, and children) reported to the state boards of health from the civilian population. The probabilities are that the total number of these cases in the civilian population of the continental U. S. during this period was very considerably in excess of the number reported to state commissioners of health. Rather conservative estimates made by the American Social Hygiene Association place this number in the civilian population at 1,106,000 men and 420,000 women."

In the "summary of accomplishments" of the Board are included protective social measures for the care of civilian persons, occupying a field force of 149 employees. The work is done in 15 states in connection with the state health commissioners. In other cases agents work with the federal military and naval organizations.

The range and importance of the work done in this department of the Board's activities is indicated by such figures as the closing of 933 houses of prostitution, arrests of 10,129 individuals because of their relationship with prostitution and the formation of 260 committees or organizations. Reformatories and detention or quarantine hospitals were aided by money distribution of $106,000, affording a total of 96,842 detention or treatment days. Anti-venereal disease programs have been instituted in 46 states. Extensive researches relating to treatment and prevention are now being conducted, a total of 35 researches being reported for 22 of the best American medical schools and universities on June 30, 1920. The most important division of activity is probably represented in the educational program, approximately $520,000 being paid to 39 normal schools, colleges and universities for "the establishment and enlargement therein of departments of hygiene for the purpose of emphasizing normally and logically, and with due proportion, the hygiene of the venereal diseases. —J. B.

DISINFECTION AND GROWTH INHIBITION

(See also Numbers 855, 874, 947, 1029)

919. The Influence of Chaulmoogra Oil on the Tubercle Bacillus. J. A. Kolmer, L. C. Davis and R. Jager. J. Infect. Dis., Chicago, 1921, **28**, 265–269.

Undiluted chaulmoogra oil and dilutions in paraffin oil had no appreciable germicidal action *in vitro* on a strain of bovine tubercle bacillus. The technic of exposing the tubercle bacilli to the oil was as follows: Tubes of Petroff's solid medium were inoculated with *B. tuberculosis* and incubated for 24 days. The oils were then poured over these so as entirely to cover the growth and slant, and the tubes were placed in the incubator at 37°C. for 24 hours. The oils were then poured off and the tubes washed with sterile salt solution. The growths were then transferred to fresh medium and incubated for 3 weeks. In other experiments, the emulsions of the bacilli were ground up in the oils. All these experiments were negative, in that no germicidal action was demonstrable by them.

Chaulmoogra oil in doses of 0.2 cc. per 100 gram of body weight administered by intramuscular injection at weekly intervals had none or slight effect on the course of tuberculosis in infected guinea pigs.—S. B-J.

920. *Ueber die desinfizierende Kraft der Sonnenstrahlen gegenuber Tuberkelbazillen.* (*The Disinfecting Power of the Sun's Rays upon Tubercle Bacilli.*) J. von Bergen. Schweiz. med. Wchnschr., 1920, No. 49, 1120–1123.

Comparative tests of direct sunlight and ultraviolet light were made in determining their bactericidal action on *B. tuberculosis*. Tubercle bacilli from various sources—pure cultures, sputum, infected tissues—were subjected to test. The organisms were exposed in a dry state and after exposure viability and virulence were determined by guinea pig inoculation. During the summer months under favorable meteorological conditions exposure for 30 minutes; in the spring and autumn for 60 minutes; and in the winter a much longer time was required to kill the bacilli. The disinfecting power of sunlight is proportional to the brightness and photometric power. Ultraviolet light was less effective.—G. H. S.

921. *Untersuchungen über die Wirksamkeit einiger chemischer Desinfektionsmittel auf Tetanussporen.* (*Studies on the Action of some Chemical Disinfectants upon Tetanus Spores.*) Theod. Moll. Centralbl. f. Bakteriol. (etc.), I. Abt., Orig., Jena, 1920, **84**, 416.

The author uses the garnet method of Kronig and Paul except for animal experiments, when silk threads are substituted.

Studies were made upon alcohol, cresols (including halogen cresols), salts of the heavy metals, alkalies, hydrogen peroxide, the halogens, formalin, Peru balsam and various powders used for wounds. The following substances killed the spores in less than 10 minutes, 1 per cent iodine trichlorid, 0.2 per cent iodine tri-chlorid, 5 per cent sugar at a 100°C., 10 per cent soap at 100°C., 0.4 per cent chlorin water, 10 per cent tincture of iodine, chlorid of lime, and 30 per cent hydrogen peroxide. The spores were killed in less than 24 hours in 1 per cent solution of potassium iodide and iodine, 0.03 per cent chlorin water, 3 per cent formalin, 3 per cent hydrogen peroxide. The other substances tested did not kill spores within 24 hours.—R. E. B.

922. *Ueber einige neuere Desinfektionsmittel. II.* (*On Some New Disinfectants. II.*) Fritz Ditthorn. Centralbl. f. Bakteriol. (etc.), I. Abt., Orig., Jena, 1920, **84**, 486–496.

Three trade preparations of cresol (Tetosol, Cresilol and Caral A), 2 chlor cresols (Parol and Caral B), 2 were from aldehyde preparations (Optiform, and Caral C) and one cresol formaldehyde preparation (Kentausan). The organisms tested were the colon bacillus, diphtheria bacillus, pyocyaneus bacillus and staphylococcus.—R. E. B.

923. *Caral, ein neues Desinfektionsmittel.* (*Caral, a New Disinfectant.*) Oskar Fischer and Theodor Goldschmidt. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1224–1225.

This proprietary disinfectant is a strongly alkaline, soapy fluid containing over 66 per cent of cresols. It was used as a substitute for Liquor cresoli saponatus of the Pharmacopeia, and found to be satisfactory.—B. C.

WATER AND SEWAGE BACTERIOLOGY

924. *Zur Bestimmung der Keimzahl im Wasser.* (*The Determination of Bacterial Numbers in Water.*) Arthur Weisz. Centralbl. f. Bakteriol. (etc.), 2. Abt., Jena, 1920, **52**, 18–25.

The author reviews the various methods in use for the numerical estimation of bacteria in water. Of the various media tested, two are found to give the highest counts. These media have the following composition: (1) 15 per cent gelatin, 0.002 per cent KCl—$NaCl$, 0.003 per cent $MgSO_4$, 0.014 per cent $CaCO_3$, and distilled water; (2) 50 per cent by volume of medium (1) and 50 per cent of 1.5 per cent agar solution in distilled water. The bacterial counts with the second medium were always higher than with the first. But the differences between the results obtained with these two media and with other media tested, including the gelatin-tapwater medium (gelatin 15 per cent, peptone 1 per cent, NaCl 0.5 per cent, were not striking and were irregular.

The preparation of media with impure but sterilized water (canal water) allows a more abundant growth of water bacteria than distilled water.—S. A. W.

FOOD BACTERIOLOGY

925. Further Studies in the Deterioration of Sugar in Storage. N. Kopeloff, H. Z. P. Perkins and C. J. Welcome. J. Agric. Research, Wash., 1920, **20**, 637–653.

A correllation was found to exist between number of organisms and subsequent deterioration and between deterioration and moisture ratio. The number of organisms increased markedly during the first 4 weeks of storage. More organisms were found in the middle than near the surface of the bag. The use of superheated steam in the centrifuge will reduce the number of organisms more than 90 per cent and may eliminate deterioration if the moisture ratio is properly controlled.—P. L. G.

926. A Bacteriological Study of Canned Ripe Olives. Stewart A. Koser. Am. Food J. N. Y., 1921, **16**, No. 2, 13–14.

A report of the result of investigations by the U. S. Department of Agriculture based on many lots of canned ripe olives following the recent outbreaks of botulism.

"1) In the bacteriological examination of 480 commercial containers of ripe olives, living microorganisms were obtained in practically every instance from samples which were abnormal as indicated either by a swelled condition or a bad odor;" 154 out of 157 springy or swelled cans and 26 out of 27 glass cans were obviously spoiled or of bad odor.

"2) Viable microorganisms were found in a small percentage of normal containers. These were either aerobic, spore-forming bacilli, cocci, or apparently dormant members of the color group"; but 8 out of 181 normal cans and 11 out of 116 glass cans were normal in odor and appearance.

"3) A study of organisms encountered in the spoiled samples show a great diversity of types, among which the colon group predominated," being found 85 times out of 195 isolations. Gram-positive cocci occurred 41 times and *B. botulinus* 7 times. No other organism was obtained more than 6 times.—J. B.

927. A Bacteriological Study of Canned Ripe Olives. S. A. Koser. J. Agric. Research, Wash., 1920, **20**, 375–379.

Of 297 normal appearing containers (181 tin, 116 glass) examined, 19 (8 tin, 11 glass) were found to contain viable organisms. Of 183 obviously spoiled or "bad odor" containers (157 tin, 26 glass) all but 3, two of which were "springers," contained viable organisms. 117 found to contain organisms were examined further. In these the colon group was found in 85 instances. Gram-positive diplococci and staphylococci were found in 41 cases. Spore bearing organisms were found in 48 cases. *B. botulinus* was found in 7 spoiled glass jars. No gas producing organisms were found in a few of the "swells." Of 85 "swells" studied the colon group was found in 75, 40 of which appeared to be pure cultures. Numerous other types were found in varying numbers of containers.—P. L. G.

928. Botulism from Cheese. Mary Nevin. J. Infect. Dis., Chicago, 1921, **28**, 226–231.

A specimen of cheese sent to the laboratories of the N. Y. State Department of Health, following the death of 3 persons with typical symptoms of botulism, was found to contain *B. botulinus* which was isolated in pure culture. Contrary to the usual belief the organism was found to grow luxuriantly and to produce spores and toxin at 37°C. The addition of peptone was found to be unnecessary for toxin production. This appears to be the first time that *B. botulinus* has been isolated from cheese, and that a soluble toxin has been detected in cheese in America.—L. C. H.

929. An Outbreak of Food Poisoning in a General Hospital. E. P. Sewell, E. B. Smith and A. H. Priestley. J. Roy. Army Med. Corps, Lond., 1920, **34**, 510.

Severe symptoms of food poisoning occuring in 473 persons with 3 fatalities were attributed to *B. suipestifer* A supposed to have been distributed through canned milk.—W. P. B.

930. Sanitation in Food Preservation. E. O. Jordan. Am. Food J., N. Y., 1921, **16**, No. 1, 19–21.

A popular address delivered before the National Canners Association emphasizes the value of thorough washing as well as heating in the ordinary canning processes. Attention is called to the fact that many anaerobic bacteria, such as *B. botulinus*, form spores, are found in animal excreta and manured soils, thus necessitating the thorough washing of products to be canned. As an illustration is cited an instance in California where string beans from a home garden had been canned successfully for 8 years; the following year (1918) the garden was fertilized, and "while the beans grown that year were canned by the same method as previously, they spoiled and some jars contained the botulinus toxin." Sanitary measures or regulations controlling the food preservation industries should secure the consumer the same degree of cleanliness that would be used in his own home.—J. B.

931. Food and Its Preservation. W. M. B. Nature, 1921, **106**, 774.

A brief review of the work done under the direction of the Food Investigation Board of the Department of Scientific and Industrial Research, London, during the year 1919. The colloidal chemistry of freezing and thawing of meat and fish, conditions of growth of bacteria and molds, enzymic nature of discoloration of fruits and more strictly chemical problems are reviewed.—Z. N. W.

932. *What Are Vitamines?* Prepared by the U. S. Bureau of Chemistry. Am. Food. J., N. Y., 1921, **16**, No. 1, 24.

A very brief statement of the 3 types of vitamines, which forms a general introductory statement preceding a report of the investigations by Carl O. Johns, to be published soon by the Bureau of Chemistry.—J. B.

HEALTH BOARD LABORATORY METHODS

933. *La diagnosi della rabbia su cervelli in putrefazione mediante l'uso dell 'acido fenico. (The Diagnosis of Rabies in Putrefied Brains Through the Use of Phenol.)* V. Puntoni. Ann. d'ig., Roma, 1920, **30**, 538–543.

The following technic is recommended for the diagnosis of rabies in brains that are in a state of putrefaction: Triturate in a mortar about one-half gram of cerebral substance, taken from various points, with about 10 cc. of physiological salt containing 0.5 per cent phenol. Allow to stand at 20–22°C. until the next day. Decant and reject the superantant liquid. Add to the sediment about 10 cc. of physiological salt, reemulsify and then inoculate under the dura mater of 2 guinea pigs.—P. M.

CANCER RESEARCH

934. *Studies on Lymphoid Activity. V. Relation between the Time and Extent of Lymphoid Stimulation Induced by Physical Agents and the Degree of Resistance to Cancer in Mice.* James B. Murphy, Waro Nakahara and Ernest Striom. J. Exper. M., Balt., 1921, **33**, 423—428.

Two methods were used to produce a hyperactivity of the lymphoid centers: (1) x-rays, (2) dry heat. The first method produces a transient activity which is preceded by a latent period; the second, a more prolonged activity which begins immediately after the administration of the agent. Mice showed no increased resistance to tumor inoculation immediately after the application of x-rays but were resistant when inoculated 7 days after treatment; while the heat-treated mice showed definite increased resistance when inoculated immediately after treatment and were still more resistant if they were inoculated 7 days after the heat was applied. The authors conclude, therefore, that resistance to tumor inoculation parallels the hyperactivity of the lymphoid centers, the hyperactivity being produced by either dry heat or x-rays.—C. G. B.

935. *Studies on X-Ray Effects. VII. Effect of Small Doses of X-Rays of Low Penetration on the Resistance of Mice to Transplanted Cancer.* Waro Nakahara and James B. Murphy. J. Exper. M., Balt., 1921, **33**, 429–432.

Mice given one small dose of x-rays showed some increased resistance to cancer inoculation one week later.—C. G. B.

936. *Studies on X-Ray Effects. VIII. Influence of Cancer Inoculation on the Lymphoid Stimulation Induced by Small Doses of X-Rays.* Waro Nakahara and James B. Murphy. J. Exper. M., Balt., 1921, **33**, 433–439.

Mice treated with a small dose of x-rays and inoculated with cancer immediately afterwards showed a marked suppression of lymphoid proliferation, while inoculation with cancer 7 days after the x-rays were given enhanced the lymphoid activity which the x-rays had primarily stimulated. Mice inoculated with cancer 7 days after exposure to x-rays fell into two groups, resistant and susceptible. The resistant group showed blood lymphocytosis, the susceptible group did not.—C. G. B.

937. *A New Strain of Transmissible Leucemia in Fowls. (Strain H.)* Vilhelm Ellermann. J. Exper. M., Balt., 1921, **33**, 539–552.

The author's summary: "1. A new strain of fowl leucosis has been transmitted through twelve generations of fowls.

"(2) An increase in virulence was observed during its passage. This was shown in a shortening of the interval between inoculation and death. The increase in virulence does not affect the number of successful inoculations, which remains approximately constant in from 20 to 40 per cent of the birds employed.

"(3) As with former strains, the disease manifests itself in various forms; i.e., myeloid and intravascular lymphoid types. A single lymphatic case was observed.

"(4) In several intravascular cases a diminution in the hemolytic power of the serum was established. This phenomenon was absent in a number of myeloid cases.

"(5) Active immunization cannot be produced by means of the subcutaneous injection of virulent material.

"(6) The finding of previous experiments that the virus is filterable has been confirmed.

"(7) The inoculation of human leucemic material into fowls gave negative results." —C. G. B.

DISEASES OF THE DIGESTIVE SYSTEM

(*See also Numbers 903, 913, 915, 991, 1041*)

938. *Patogenesi del colera III. Il protide del vibrione colerico.* (*Pathogenesis of Cholera The Protein of the Cholera Vibrio.*) G. Sanarelli. Ann. d'ig., Roma, 1920, **30**, 531–536.

The toxic action of cholera protein was studied upon guinea pigs and rabbits, using a method which imitates the process which takes place in the peritoneal cavity. A 24-hour agar growth was suspended in 9 cc. of 0.1 per cent sodium carbonate; 1 cc. of a 1 per cent pancreatin solution was added with 4 or 5 drops of toluol. The suspension was placed in the incubator at 37°C. for 24 hours.

The digested suspension assumed the opalescent appearance of a colloidal solution. It was precipitated by both alcohol and saturated ammonium sulphate.

The precipitate with ammonium sulphate revealed the presence of phosphorus; hydrolyzed with sulphuric acid it showed purine bases when tested with silver nitrate. The protein of the cholera vibrio obtained by the method described behaved like a true colloid, and has all specific antigenic properties of the organism. The author draws the following conclusions:

1. The toxin of the cholera vibrio is represented by the protein of the bacterial body itself.

2. Such protein is set free by digesting the organisms with pancreatin. When injected into guinea pigs intravenously it produces an immediate toxic action attacking the digestive organs.

3. The lesions produced in the intestinal mucosa of the guinea pig are similar to those observed when a lethal dose of the organism killed by heat is injected intraperitoneally. —P. M.

939. *Studi intorno ad una epidemia di dissenteria bacillare.* (*Studies upon an Epidemic of Bacillary Dysentery.*) C. Vallardi. Ann. d'ig., Roma, 1920, **30**, 544–560.

From a series of observations the author comes to these conclusions: (1) during an epidemic of amebic dysentery it is a grave error to overlook cultural tests and be satisfied with the finding of amebae; (2) more often than is generally supposed, there exists a mixed infection of amebae and dysentery bacilli; (3) patients with amebae in their feces often responded more quickly to antidysenteric serum treatment than to emetin.—P. M.

940. *Ueber die Rasse E* (*Milchzuckerrasse*) *der Pseudodysenterie.* (*On the E-race* (*Lactose-race*) *of Pseudodysentery Bacilli.* W. E. Hilgers. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Teil, Orig., Jena, 1920, **30**, 77–94.

A study of strains of pseudodysentery bacilli isolated chiefly from children suffering with follicular enteritis. It is suggested that follicular enteritis of children is caused by this organism. Its distinctive characteristics are its rapid fermentation of carbohydrates, especially lactose. As it readily produces acid from lactose and clots milk, it is called the "milk-sugar race," or Type E of Kruse. Some strains of this race are strongly toxic. Organisms of this group can be differentiated by the absorption of agglutinins from the other dysentery and pseudodysentery bacilli. It is identical with Sonne's Group III.—S. B-J.

941. *The Diagnosis of Typhoid and Paratyphoid Infections.* Henry J. Goeckel. J. Lab. & Clin. M., St. Louis, 1921, **6**, 335–337.

The author states that typhoid and paratyphoid bacilli may be demonstrated in the feces of patients and convalescents without resorting to cultures by the use of high titre agglutinating serum; also that typhoid bacilli may appear in the urine before a positive Widal is obtainable, and that their presence in the urine may at times be the only definite means of establishing the diagnosis of typhoid fever. He also finds that a typhoid cystitis can occur without producing agglutinin in the blood.—F. W. H.

942. *Hemolytic Streptococci of the Appendix Vermiformis.* A. Kraft. J. Infect. Dis., Chicago, 1921, **28**, 122–126.

Hemolytic streptococci were in 2 of 48 normal appendices (4.17 per cent) and in 4 of 77 abnormal appendices (5.2 per cent). These streptococci were found only in appendices which were the seat of acute disease. They were not recovered from the chronically inflamed appendices. When hemolytic streptococci occurred in pathologic appendices they were present in large numbers and in practically pure culture.

Two types of streptococci were found, namely, *Streptococcus infrequens* (5 strains) and *Streptococcus hemolyticus* II (1 strain).—S. B-J.

DISEASES OF THE GENITO-URINARY SYSTEM

(*See also Numbers 847, 918, 1006, 1007, 1008, 1009, 1010, 1021, 1025, 1026*)

943. *Social Hygiene Program of the Army.* Percy M. Ashburn. Social Hyg., N. Y., 1921, **7**, 23–40.

A comparison of the venereal disease rate of transfer in different phases of military life, giving a yearly chart of admission rates for venereal disease in the United States Army from 1880 to 1917, the rate for the years 1913 to 1917 varying between 82 and 112 per 1000 "mean strength."

A second chart gives the rates for venereal disease from October, 1917, to September, 1920, in the forces in the United States, the American Expeditionary Forces and the forces in Germany. The range of the Home Forces calculated weekly was usually well below 100 per 1000, with a striking exception in the fall of 1918, when it exceeded 300; for 1920 the average rate is well below 50. The rate for the Expeditionary Forces was very similar to the Home Forces except for a September to November, 1919, "peak" of 150–800 cases. For the American Forces in Germany, a similar "peak" of 400 was observed at the same time and a slightly higher rate for the data obtainable for the first half of 1920, 100 to 250 cases.—J. B.

944. Gonococcus Types. I. John Hermanies. J. Infect. Dis., Chicago, 1921, **28**, 133–142.

A study of 85 strains was made. These came from urethritis, vulvovaginitis, and ophthalmia. The strains were grown on salt free ascitic agar by thepartial tension method of Wherry. By means of absorption tests Hermanies has shown 6 groups of the gonococcus, the first 2 groups containing all but 7 of the 85 strains. Type 2 is further subdivided into 4 subgroups. —L. C. H.

945. The Treatment of Gonorrheal Complications by the Combination of Antigonococcus Serum and a Temperature-Raising Agent. J. Reenstierna. J. Urol., Balt., 1921, **5**, 63–65.

The author reports encouraging results by the use of antigonococcus serum with addition of dead bacteria cultures as a temperature raising agent. Injections were made into the gluteal muscles.

The greater part of the acting principle of the serum is believed to be an anti-toxic one. Goats and rams were used for the production of serum.

The most striking results were obtained in those patients with complications of arthritis, epididymitis and prostatitis.—R. D. H.

946. Comparison of Smear, Culture and Complement Fixation in Chronic Gonorrhoea in Women. James D. Smith and M. A. Wilson. J. Immunol., Balt. & Cambridge, Eng., 1920, **5**, 499–506.

This is a preliminary report. The authors charted 50 cases diagnosed as clinically mild chronic gonorrhea and 58 control cases considered to be clinically negative. They concluded that complement fixation is of undoubted value in chronic infections of gonorrhea. In the acute or early subacute infections it is on a par with the Wassermann test in the initial lesion stage prior to development of the secondary. A non-gonorrheic does not give a positive test but a gonorrheic may give a negative test in certain stages of the disease.—R. R. H.

947. Action of Mercurochrome-220 on the Gonococcus. Ernest O. Swartz and David M. Davis. J. Am. M. Ass., Chicago, 1921, **76**, 844.

Mercurochrome-220 has a strong germicidal power against the gonococcus. The gonococcus is about 40 times as susceptible as *B. coli.* Solutions of mercurochrome-220 degenerate on standing and can be used only when fresh.—P. G. H.

948. Pathological and Public Health Aspects of the Diagnosis of Syphilis, Acquired and Congenital, in the First Year of the Disease. Wm. Campbell. Pub. Health, Lond., 1921, **34**, 7-13.

Emphasis is laid on the necessity of early diagnosis of syphilis, i.e., before the onset of the eruptive stage, to insure cure of the disease. Serous exudate from a sore consequent on recent exposure, should be examined for the spirochete, and if found present treatment begun; at this early state a Wassermann is most often negative in adults. Cures are possible after the Wassermann becomes positive, but more difficult.

Diagnosis of congenital syphilis in children by clinical symptoms proved unsatisfactory in the Bradford Clinic. In 1917, 34.08 per cent of 2,441 suspected cases showed clinical signs of syphilis. Of the 179 infants that died, 78.21 per cent showed clinical signs of congenital syphilis and only 32.41 per cent of these were certified to have died of syphilis. 1918 showed almost indentical results.

A series of reports of serological diagnoses, including infants, a few mothers and fathers, shows the following results: In 1917, 44 out of 477 cases tested were positive. In 1918, 21 out of 158 cases tested were positive. In 1919, 21 out of 167 cases were positive. 15.4 per cent of the total of 65 babies tested were positive, 13.3 per cent out of the 90 mothers tested were positive, and 22.3 per cent of the 9 fathers tested were positive. In congenital syphilis with manifest symptoms, out of 394 cases tested 96.9 per cent were positive, and of the latent cases, 34 of which were tested, 82.3 per cent were found to be positive.

These results tend in favor of serological diagnosis of both congenital and acquired syphilis.—J. B.

949. Urological and Venereal Idiosyncrasies Presented by the Negro. G. H. Day. J. Urol., Balt., 1921, **5**, 19–27.

A comparison of the urologic and venereal diseases in negro and white patients was made. These included 4 year admissions to the Louisville City Hospital and the infirmary patients of 2 large military camps.

It is concluded that the venereal rate is much higher in negroes but the complications other than stricture, lymphadenitis, and lesions of the extragenitals are more numerous in white men. The keloid tendency is a predisposition to stricture.—R. D. H.

DISEASES OF THE LOCOMOTOR SYSTEM

950. Artritismo, Reumatismo Cronico o enfermedades del metabolismo, su tratamiento. (Arthritism, Chronic Rheumatism or Metabolic Disorders. Their Treatment.) ALEJANDO LAMARQUE. Semana méd., Buenos Aires, 1920, **27**, 655–657.

The author advances the hypothesis that rheumatism and the related diseases are the result of abnormal metabolism in which the endocrine glands play a decisive rôle. Ten years' work based on this conception of the disease has led to the preparation of his "Iodomone," an iodin-hormone complex, with which he has treated more than 3000 cases. Excellent clinical results are claimed. The details of the preparation of "Iodomone" are not given. It is stated, however, that it consists of 10 milligrams of iodin to 1 cc. of granular elements obtained from normal horse serum.—C. G. B.

DISEASES OF THE NERVOUS SYSTEM

(See also Numbers 835, 836, 837, 891, 933)

951. Some Deductions from a Series of 243 Military Cases of Cerebrospinal Fever in the London District with Regard to the Variations in the Therapentic Potency of Serum. J. A. GLOVER. J. Roy. Army Med. Corps, Lond., 1920, **34**, 499.

A chart shows the incidence and type of cases for the years 1915-1918 with mortality under the use of various anti-sera. The clinical results show a confirmation of the estimates of therapeutic potency formed by laboratory tests of the anti-endotoxin capacity of the serum by Gordon's modification of Besredka's method.—W. P. B.

952. Cerebrospinal Meningitis at Angel Island Immigration Station, California. JOSEPH BOLTEN. Pub. Health Rep., Wash., 1921, **36**, 593–602.

An epidemiological study was made of an outbreak of meningitis occurring at the Angel Island Immigration Station during the winter of 1920 and 1921. During this period 15 cases occurred among Chinese immigrants. Food, unclean dishes, bed linens and towels were ruled out as factors for conveying the infection. Cultural studies of detained male Chinese immigrants disclosed 9.1 per cent of carriers among the 253 examined. Overcrowding in the barracks was held responsible for the spread of the disease, and when this was remedied and carriers were isolated, no further cases occurred.—I. A. B.

953. Beitrag zur Meningokokkendiagnose. (The Diagnosis of Meningococci.) ERICH EICHHOFF. Centralbl. f. Bakteriol. (etc.), I. Abt., Orig., Jena, 1920, **84**, 461–466.

The author records the isolation of 2 organisms somewhat resembling meningococci from cases of cerebrospinal meningitis. The organisms isolated differ from meningococci microscopically in their failure to produce involution forms and culturally in that they grow well upon protein and nutrient media at room temperature. They ferment maltose and dextrose very slightly. They are not agglutinated by meningococcus (anti-meningococcic) serum. —R. E. B.

954. L'encéphalite léthargique. (Lethargic Encephalitis.) E. KREBS. Semana méd., Buenos Aires, 1920, **27**, 646–654.

The author considers quite comprehensively and concisely the symtomatology, pathology, diagnosis and treatment of lethargic encephalitis.—C. G. B.

955. Sull' eziologia dell' encefalite letargica. (The Etiology of Lethargic Encephalitis.) S. S. D'ANTONA AND F. TONIETTI. Policlin., Roma, 1920, **27**, 1075–1080.

It was shown that there is usually present in the blood and spinal fluid of persons suffering from lethargic encephalitis a virus capable of infecting guinea pigs when injected either intraperitoneally or endocerebrally. The virus passes through a Berkefeld filter and may be preserved in 50 per cent glycerin. The infection in guinea pigs may be transmitted in series. Guinea pigs may be infected by spraying the filtrate from the Berkefeld filter into the nares.

The cat is susceptible to the virus, and presents symptoms, especially that of sleepiness, similar to the disease in man.

Bacteriological examination of the spinal fluid and blood of persons afflicted with the disease was always negative.—P. M.

956. L'encefalite Lethargica. (Lethargic Encephalitis.) G. ECONOMO. Policlin., Roma, 1920, **27**, 93–148.

The history of the disease is reviewed and the clinical pictures of 13 cases, under observation for months, are described

From the histological, clinical, and experimental results regarding the cause of the disease the author concludes as follows: "The disease was transmitted to monkeys, thus showing its infectious nature, which is probably due to the streptococcus of Wiesner. The virus has special affinity for the grey matter, and is transmitted through the lymphatics. When injected subdurally into the monkey the first symptoms appear within six hours."

The symptomatology of the disease is given in detail; the onset, the fever, deliriums, sleep, the meninges, spinal fluid, blood and urine, ocular alterations, bulbular alterations, diagnosis, therapy, and prognosis of the disease are completely covered.

The subject is admirably treated and thus should be a valuable contribution to the study of this puzzling disease.—P. M.

957. *Encefalitis letargica.* (*Lethargic Encephalitis.*) Julio A. Petrocchi and Alfredo Harday. Semana méd., Buenos Aires, 1920, **27**, 13–15.

The authors give a historical review of lethargic encephalitis and report a case belonging to the mental type of the disease, giving in detail the clinical and laboratory findings. The case presents nothing unusual.—C. G. B.

958. *La conception bordelaise de l'encéphalite lethargique ou encephalomyelite epidemique.* (*The Bordeaux Conception of Lethargic Encephalitis or Epidemic Encephalomyelitis.*) René Cruchet. Semana méd., Buenos Aires, 1920, **27**, 1–3.

The author gives a résumé of his experience with lethargic encephalitis in France from 1915 to 1919. The disease is considered from the clinical viewpoint, the onset, the various types and the convalescence being described. The author prefers to call the disease epidemic encephalomyelitis, since lethargic encephalitis is descriptive of only one of many types of this disease entity.—C. G. B.

DISEASES OF THE RESPIRATORY SYSTEM

(Except Influenza and Tuberculosis)

(*See also Numbers 884, 1017, 1024*)

959. *The Etiology of Acute Inflammations of the Nose, Pharynx and Tonsils.* Stuart Mudd, Samuel B. Grant and Alfred Goldman. J. Lab. & Clin. M., St. Louis, 1921, **6**, 322–330.

This portion of the article considers the concurrent bacteriologic studies of the summer of 1920, the interpretation of reactions to chilling, anaphylactic "colds" and acute inflammation due to systemic, toxic and neurotic factors, to mechanical and chemical irritations, to extreme low temperatures and to nasal obstruction. The authors conclude their paper with a summary of the various causes of acute inflammation of the pharynx, tonsils and nose.—F. W. H.

960. *Spirochetal Pulmonary Gangrene.* M. Fishberg and B. S. Kline. Arch. Int. Med., Chicago, 1921, **27**, 61–70.

The organism found in this condition is probably *Spirochaeta bronchialis* as described by Castellani.—G. H. R.

961. *Sulle micosi del sistema respiratorio.* (*The Mycosis of the Respiratory Tract.*) C. Basile. Policlin., Roma, 1920, **27**, 1171–1174.

Brief notes are given concerning the characters of pathogenic hyphomycetes. The pathologic anatomy, symptomatolgy and diagnosis of diseases caused by mycetes are discussed. Potassium or sodium iodide is recommended as a therapeutic agent.—P. M.

962. *Ueber die Verbreitungsweise der Diphtheriebazillen im menschlichen Organismus.* (*The Distribution of Diptheria Bacilli in the Human Body.*) Fr. Graetz. Centralbl. f. Bakteriol. (etc.), I. Abt., Orig., 1920, **84**, 401–415.

After a review on the literature on the presence of diphtheria bacilli in the blood and in the internal organs of the human body the author concludes that when thus found they are to be regarded as saprophytic and the bacteremia as an incident in some phase of the disease and not responsible primarily for any of the symptoms. Diphtheria, in other words, is to be regarded as exclusively a toxemia.—R. E. B.

INFLUENZA

963. *Acute Respiratory Infection in Man Following Inoculation with Virulent B. influenzae.* Russell L. Cecil and Gustav I. Steffen. J. Infect. Dis., Chicago, 1921, **28**, 201–225.

Two strains were used, isolated from typical cases. These, when injected into the nose and throat of healthy persons, excited an acute respiratory disease, similar in many respects to influenza but falling short of the typical clinical picture. Inoculations with hemolytic streptococci gave negative results in 8 cases and an acute tonsillitis in another. Two volunteers inoculated with pneumococcus cultures remained well. Freshly isolated, virulent strains of *B. influenzae*, in contrast to these other organisms, gave many of the symptoms of clinical influenza.—L. C. H.

964. *Experiments upon Volunteers to Determine the Cause and Mode of Spread of Influenza, Boston, November and December, 1918.* M. J. Rosenau, W. J. Keegan, Joseph Goldberger and G. C. Lake. Hyg. Lab. Bull. No. 123, Wash., 1921, p. 5–41.

Sixty-two volunteers were subjected to various methods of treatment in an effort to communicate influenza. Pure cultures of Pfeiffer's bacillus, filtered and unfiltered secretions from the upper respiratory passages of influenza patients were conveyed to the nose and throat of the experimental subjects without reproducing the disease. Inoculation of freshly drawn citrated blood by the subcutaneous route and exposure to droplet infection were also without results. In explanation of the failure to transmit the disease, it is indicated that the subjects chosen might have been immune or that material for transmission should have been secured earlier, perhaps in the incubation period.—I. A. B.

965. *Experiments upon Volunteers to Determine the Cause and Mode of Spread of Influenza, San Francisco, November and December, 1918.* G. W. McCoy and DeWayne Richey. Hyg. Lab. Bull. No. 123, Wash., 1921, 42–53.

A number of volunteers, from the United States Naval Training Station at San Francisco, who had been under quarantine a month and not exposed to influenza were the subjects of experimentation. The entire personnel of the station including the volunteers received a vaccine containing *B. influenzae*, pneumococcus Types, I, II and II and *Streptococcus hæmolyticus* previous to the tests. Nasopharyngeal secretions, filtered and unfiltered, were instilled into the upper respiratory passage of some of the volunteers and in two cases into the conjunctival sacs. Subcutaneous inoculations of filtrate and whole blood were made in several cases, and spraying of living cultures of Pfeiffer's bacillus into the nasopharynges was practiced. In no case was a clinical case of influenza produced, though three of the subjects became ill with acute lacunar tonsillitis.—I. A. B.

966. *Experiments upon Volunteers to Determine the Cause and Mode of Spread of Influenza, Boston, February and March, 1919.* M. J. Rosenau, DeWayne Richey, G. W. McCoy, Joseph Goldberger, J. P. Leake and G. C. Lake. Hyg. Lab. Bull. No. 123, Wash., 1921, p. 54–98.

Forty-nine volunteers from the United States Naval Detention Training Camp, Deer Island, Massachusetts, were the subjects of experiment. Attempts were made to produce influenza by inoculations of Mather's coccus and of mixtures of the influenza bacillus and *Staphylococcus aureus* and by inoculation of secretions from influenza paitents. Two cases of influenza, one of doubtful influenza and several cases of tonsillitis developed as a result of the experiments. The conclusion is reached that presumptively influenza may be transmitted by means of the secretions of the upper air passages from patients in the early stages of the disease, probably within less than 12 hours after onset. Attempts to transmit the disease by means of cultures of Pfeiffer's bacillus and Mather's coccus were unsuccessful.—I. A. B.

967. *Influenza Studies. IV. Effect of Vaccination against Influenza and Some Other Respiratory Infections.* E. O. Jordan and W. B. Sharp. J. Infect. Dis., Chicago, 1921, **28**, 357–366.

A vaccine was used containing *B. influenzae*, streptococci and staphylococci. There were 2873 vaccinated and 3193 unvaccinated persons. Among the vaccinated there were 118 cases of influenza or 4.1 per cent. Among the unvaccinated there were 152 cases or 4.8 per cent. Seven pneumonia complications with 2 deaths occurred among the 118 vaccinated cases. Twelve pneumonia complications with 2 deaths occurred among the 152 unvaccinated cases. Pneumonia not associated with influenza was somewhat less frequent among the vaccinated than the unvaccinated,—6 cases as compared with 13. The authors do not feel that this difference is sufficient to warrant any claim that the vaccine was particularly efficacious.—L. C. H.

968. *Influenza Studies, II. A Search for Obligate Anaerobes in Respiratory Infections. An Anaerobic Micrococcus.* I. C. Hall. J. Infect. Dis., Chicago, 1921, **28**, 127–132.

No organisms resembling the anaerobic spirochete and *B. rhinitis* described by Tunnicliff were seen in the cultures from 33 specimens taken from 25 persons suffering from acute inflammatory conditions of the upper respiratory tract. Various methods for securing anaerobic conditions were used, and the technic of Tunnicliff was duplicated. These results would seem to indicate that obligate anaerobes were not important in these infections.

In one instance an obligate anaerobic coccus was isolated from a patient who had had rhinitis for 48 hours. This coccus morphologically resembled the staphylococci, but was culturally like the streptococci. The organism has not been definitely assigned in the system of classification.—S. B-J.

969. *Influenza Studies. III. Attempts to Cultivate Filtrable Viruses from Cases of Influenza and Common Colds.* Sara E. Branham and Ivan C. Hall. J. Infect. Dis., Chicago, 1921, **28**, 143–149.

An attempt was made to cultivate filtrable viruses by the technic of Foster. The tissue-ascitic fluid medium of Noguchi was chiefly used. The results were negative with a large series of common colds, specimens being collected from the day of onset till convalescence. In a few cases of influenza investigated the results were also negative. It is concluded that negative experiments do not offer conclusive evidence that a filtrable virus is not involved, although the uniformly negative results obtained with a large and representative series of colds are not without significance.—L. C. H.

970. *A Study of the Lesions Produced by Filtrates of Influenza Sputum.* M. W. Hall. Arch. Int. Med., Chicago, 1920, **26**, 612–629.

The sputum from early cases of influenza was collected, ground with sand and salt solution and filtered through Berkefeld or Mandler filters. The injection of such preparations produced a definite pathologic picture. These pathologic conditions are similar to those found in early cases of influenza. By injecting lung emulsions of infected animals the same conditions can be reproduced indefinitely. Similar preparations from non-influenza cases produced no changes in animals. This filterable virus shows a remarkable resistance to heat. —G. H. R.

971. *Cultivation of a Filtrable Organism from the Nasopharyngeal Washings in Influenza.* Leo Lowe and Frederic D. Zeman. J. Am. M. Ass., Chicago, 1921, **76**, 986.

A minute filtrable Gram-negative organism has been isolated in pure culture from nasopharyngeal washings of early cases of uncomplicated influenza. By intratracheal inoculation of a culture typical clinical symptoms and pathological changes were produced in rabbits. The same effect on rabbits was obtained by inoculation of a culture kept at incubator temperature for 14 months. This infectious agent has been carried through several animal passages and the organism was recovered from the lungs of animals suffering from experimental influenza.—P. G. H.

972. *Sull 'influenza.* (*Influenza.*) F. Micheli. Policlin., Roma, 1920, **27**, 45–74.

A review of the etiology and pathogenesis of influenza is given. The multiplicity and variability of the bacterial flora in relation to vaccine prophylaxis and serum therapy are discussed.—P. M.

973. *The Correlation of Rabbit Pneumonia and Human Influenzal Pneumonia.* C. C. Saelhof. J. Infect. Dis., Chicago, 1921, **28**, 374–380.

"Rabbit bronchopneumonia may be caused by *B. bipolaris*, which belongs to the hemorrhagic septicemia group. The disease can be produced experimentally.

"Under natural and experimental conditions a bronchopneumonia appears which is usually distributed throughout all portions of the lungs. Perivascular and peribronchial infiltration of the lymph spaces and regions of central necrosis are the most constant lesions."

Both rabbit pneumonia and influenzal pneumonia are bronchopneumonic processes often confluent in type. "They differ, however, in that in rabbit pneumonia the perivascular and peribronchial leukocytic infiltration of the lymph spread and regions of necrosis in the consolidated portions are more constant and striking features."—S. B-J.

TUBERCULOSIS

(*See also Numbers 919, 920, 983*)

974. *The Course of the Tubercle Bacillus from Sputum to the Child.* Allen K. Krause. N. York State J. M., N. Y., 1921, **21**, 83–86.

Krause gives the 3 presumptive methods of infection that have the widest currency—Cornet's, Flagge's and Anfrecht's, Weichselbaum's, etc.— and follows this with a statement of the possibilities of human infection which will probably be generally accepted. In the light of the facts and conditions of everyday existence, of the early rapid tuberculization of the species and of the curve of infection for children he submits these hypotheses to a critical analysis. The author then states that cow's milk and contaminated food, droplet and dust infections all play their parts but that outdoor infection by contact with crude sputum is certainly more frequent than has usually been emphasized. Also that the prevalence of sputum will help to explain the frequency of human infection in early life.—F. W. H.

975. *Vaccination against Tuberculosis.* Editorial. Pub. Health Lond., 1920, **34**, 17.

This recalls a suggestion by Metchnikoff that through early infection with the tubercle bacillus by tuberculous milk some degree of immunity may be conferred upon the individual if recovery follows the attack. Possibly tuberculous milk has been the cause of the degree of immunity which the race possesses, but the cost in lives has been great. Calmette claims that immunity against tuberculosis may be conferred on the cow, the source of human infection by means of doses of bacilli of modified or attenuated virulence. The deduction is that man, too, may thus be protected, and that "it is merely a matter of determining the most surely effective procedure and the duration of its protective effects."—J. B.

976. *Resistance to Tuberculosis. A Nonimmunologic Chemical Factor Worthy of Consideration.* H. J. Corper, Harry Gauss and O. B. Rensch. J. Am. M. Ass., Chicago, 1921, **76**, 1216.

Humoral antibodies and lymphocytes fail to explain resistance to tuberculosis. Allergic phenomena require further elucidation. The phagocytic action of the wandering endothelial cell is important. Deficiency of carbon dioxid in the body favors tuberculosis while an accumulation retards it. Growth of tubercle bacilli in the test tube is inhibited by presence of 3 per cent carbon dioxid and 15 per cent is destructive. Cultures of tubercle bacilli buried in tissues of animals and permitted to acquire the carbon dioxid concentration of the body are inhibited in growth, while other cultures similarly buried show no inhibition. Carbon dioxid may play a significant rôle in the resistance to tuberculosis. Fatigue, exhaustion, exposure, metabolic diseases, etc., as probable etiologic factors, in the causation of tuberculosis may exert their influence in view of their ability to alter the carbon dioxid content of the body.—P. G. H.

977. *Mercury Compounds in the Chemotherapy of Experimental Tuberculosis in Guinea Pigs. I.* Lydia M. DeWitt. J. Infect. Dis., Chicago, 1921, **28**, 150–169.

Using a large number of organic and inorganic mercury compounds results were obtained indicating that not only the length of life was increased but the extent of the disease was lessened, by the use of certain compounds. The author states that the results, slight as they may be, seem to justify further work.—L. C. H.

978. *The Effect of Mustard Gas (Cichlorethylsulphid) on Experimetal Tuberculosis.* H. J. Corper and O. B. Rensch. J. Infect. Dis., Chicago, 1921, **28**, 286–293.

Mustard gas in 25 per cent glycerol is bactericidal toward virulent tubercle bacilli *in vitro* after exposure of 30 minutes to 0.1 per cent and 2 hours to 0.01 per cent. Mustard gas in 0.1 per cent strength in 25 per cent glycerol injected into guinea pigs entirely prevented the development of systemic tuberculosis. Even 0.01 per cent has a distinct retarding influence. Mustard gas given subcutaneously in amounts consistent with life (0.001 cc. in glycerol) in single injections or repeated at 4–day intervals for 3 or 4 injections had no appreciable effect on infection after it was once started.—L. C. H.

979. *Ueber die Wildbolz'sche Eigenharn- und Eigenserumreaktion zum Nachweise aktiver Tuberkuloseherde. (Recognition of Active Foci of Tuberculosis by Wildbolz's Homologous Urine and Serum Reaction.)* O. Imhof. Schweiz. med. Wchnschr., 1920, No. 46, 1033-1038.

Comparative tests were made of the reactions of tuberculous and normal individuals to the intracutaneous injection of concentrated urine and protein-free serum from cases of tuberculosis. The reactions secured indicate that in active cases of tuberculosis antigen is to be found in both the blood serum and in the urine. In cases of clinically established tuberculosis the reactions were always positive while in non-tuberculous individuals negative results were secured. Tuberculin (O. T.) injections were given at the same time to detect anergic individuals.—G. H. S.

980. *Trauma and Tuberculosis.* Thomas Oliver. Practitioner, Lond., 1920, **104**, 321–329.

Several cases are described showing the development of acute tuberculosis following injury of various kinds. The author, however, thinks the injury to be only the exciting cause.—C. P. B.

DISEASES OF CHILDREN

(See also Numbers 940, 1023)

981. *Vaccinoprofilassi e vaccinoterapia della pertosse. (Vaccine Prophylaxis and Vaccine Therapy in Pertussis.)* L. Spolverini. Policlin., Roma, 1920, **27**, 1043–1046.

From a study of 144 cases, the author concludes: (1) Vaccine prophylaxis with the germ of Bordet-Gengou against pertussis, if practiced before the onset of specific symptoms gives very good results. (2) Vaccine therapy gives negative results if the vaccine is used 18 to 20 days from the onset of the disease; at this period the sputum is negative for *B. pertussis*. Good results are obtained when the vaccine is used before the tenth day from the beginning of the disease; *B. pertussis* is generally present in the sputum at this period.

In order to obtain good results large doses of vaccine must be administered, for example from 2 to 4 and up to 6 billion organisms per cc. Small doses fail to give results. The injections are given on alternate days.—P. M.

GYNECOLOGY AND OBSTETRICS

(See also Numbers 841, 946)

982. *The Rôle of the Maternity Hospital in Public Health Work.* Edmund M. Smith. Pub. Health, Lond., 1921, **34**, 67–71.

"In 1916 in England and Wales, one mother was lost from every 243 births (a total of 1,239 for the year); 148 mothers out of every 100,000 were lost through septicaemia; and 239 per 100,000 died from non-septic causes, whilst a proportion of the births, varying from 3 to 8 per 1000 were still-births, 50 per cent of which, by the way, were due to syphilis."

Although the puerperal fever death rate has declined over 25 per cent since 1906, it is still true that most of the maternal mortality and illness is preventable. One surgeon, for example, states that 40 per cent of his work in respect to diseases of women was for chronic suffering following child-bearing.

Owing to the increased demand upon the hospital, due in great part to housing shortage, there is a plea for the enlargement of hospital facilities covering special provisions for "septic cases," for those suffering also with venereal disease, and adequate pre-maternity and post-maternity treatment, and hospital care of the infants.—J. B.

OPHTHALMOLOGY

983. *Tuberculina en las lesiones oculares. Curación de un caso de escleroqueratitis tuberculosa de ambos ojos. (Tuberculin in Eye Lesions. The Cure of a Case of Tuberculous Sclero-keratitis of Both Eyes.)* Severo Sanchez Gardel. Semana méd., Buenos Aires, 1920, **27**, 707.

The author reports a case of tuberculous sclero-keratitis which was cured by tuberculin treatment. It is maintained that a majority of such cases can be so cured if the tuberculin is properly administered, small doses being given at first. Each case must be carefully studied and every sign and symptom taken into consideration.—C. G. B.

OTOLOGY AND NOSE AND THROAT DISEASES

984. Uber Komplikationen und Lebensgefährlichkeit der Neberhöhleneiterung. (The Complications and Danger to Life of Purulent Infections of the Accessory Simuses.) E. Schlittler. Schweiz. med. Wchnschr., 1920, No. 49, 1112–1116; 1142–1146.

In most of these infections the etiologic agents are streptococci or staphylococci. Multiple infection is not unusual.—G. H. S.

985. Gli zuccheri nella cura dell'ozena. (Sugars as a Cure for Ozena.) D. Brunetti. Arch. di farmacol sper., Roma, 1920, **29**, 156–160.

Very encouraging results were obtained in the treatment of ozena with sugars. Clinically there was noticed a distinct change in the rhinoscopic picture. The secretion increased at first and the odor disappeared. Later the secretion diminished and mucosa assumed a reddish color approaching the normal.—P. M.

ORAL BACTERIOLOGY

986. A Study of the Thrush Parasite. Bertha C. Fineman. J. Infect. Dis., Chicago, 1921, **28**, 185–200.

A study of 17 strains showed constant morphologic and cultural characteristics. Carbohydrate media were fermented uniformly and constantly by all strains and are of value in the identification of the species. Agglutinins are not produced by the thrush parasite in sufficient quantities to be of diagnostic value or differential aid. The thrush organism produces chlamydospores but not ascospores. It is correctly placed in the genus *Oïdium*. The organism tends to assume the mycelial form in liquid media, in media containing complex carbohydrates, in low oxygen tension, in low surface tension, while unicellular, yeast like forms occur in solid media, in the presence of simple carbohydrates, an abundance of oxygen or media of higher surface tension. It is suggested that pleomorphism is an attempt at adaptation, the mycelial form developing in relatively unfavorable conditions.—L. C. H.

987. Beitrag zum Studium der Aktinomykose. (Contribution to the Study of Actinomycosis.) A. Rodella. Centralbl. f. Bakteriol. (etc.), I. Abt., Orig., 1920, **84**, 450–461.

The author describes an organism isolated from an ulcerated jaw. Its cultural characters are fully described. Conidia formation is marked upon agar cultures. Animal inoculation proved negative. It is concluded that the organism isolated probably belongs to the form *Streptothrix albidoflava* of Lachner Sandoval. Its resemblance is noted also to the *Mycromyces hofmanni*.—R. E. B.

FILTERABLE VIRUSES

(See Numbers 969, 970, 971)

SURGICAL BACTERIOLOGY

(See also Numbers 917, 1011)

988. Prüfung der prophylaktischen Wunddesinfektionswirkung des Trypaflavins im Tierexperiment. (Animal Experiments in Testing the Prophylactic Disinfection of Wounds by Trypaflavin.) M. Feiler. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Teil, Orig., Jena, 1920, **30**, 95–104.

In order to study the prophylactic action of trypaflavin in wounds, the author rubbed diptheria bacilli into incisions in the skin of the abdomen of guinea pigs and then bathed these wounds at various intervals with a 1 per cent solution of trypaflavin. The infected incisions on control animals were bathed in a similar manner with 0.85 per cent salt solution. The wounds treated with trypaflavin healed readily, did not show the usual necrosis due to *B. diphtheriae*, and the animals remained in good health. The animals treated with salt solution died in 4 days with the usual lesions of infection with the diphtheria bacillus. Similar wounds, treated with trypaflavin 1 hour before infection also healed readily, and these animals also survived. The results of the healing of infected superficial wounds under the treatment with trypaflavin are reported as evidence of the beneficial prophylactic action of this drug.—S. B-J.

989. Ueber drei Falls von Infektion mit echten, streng anaeroben Streptotricheen. (Three Cases of Infection with strictly Anaerobic Streptothrices.) Rahel Plaut. Centralbl. f. Bakteriol. (etc.), I. Abt. Orig., 1920, **84**, 440–450.

The author notes that the first organism of this type was *Streptothrix foersteri* described by Cohn in 1874 and first cultivated by Silberschmidt in 1899. Three new cases of strictly anaerobic Streptothrices are recorded. The first was isolated from a swelling in the region of the left parotid. The organisms were found in the purulent discharge and grew anaerobically at first only in Tarozzi bouillon. The second organism was isolated from abscesses on the lower jaw of a man. Growth of this organism was best secured in Tarozzi bouillon. The third was isolated from a case of empyema. These organisms differ from the Actinomyces when grown in the body through their failure to form clubbed ends and in their relative benignity. In culture media they differ in their strict anaerobiosis. The organisms are not named. —R. E. B.

SEROLOGY

(*See also Numbers 835, 836, 885, 948*)

990. *A Study of the Specificity of the Absorption of Anti-Bacterial Precipitins.* Charles Krumwiede and Georgia M. Cooper. J. Immunol., Balt. & Cambridge, Eng., 1920, **5**, 547–562.

B. typhosus, B. sanguinarium, B. pullorum, B. paratyphosus and one or two other related types were studied with immune horse and rabbit serum. The method of precipitin absorption shows in cases of closely related types of bacteria, that the bacterium heterologous to the serum, in removing the precipitins active against itself may also remove the precipitins active against the homologous type. Hence the precipitin absorption method is inadequate as a primary method for the differentiation of related bacteria. Similar failures may occur with the agglutination reaction, but such failures may be easily corrected by the absorption method. —R. R. H.

991. *A Serological Study of Cholera Immunity. I. Agglutinin.* Rokuro Umemura. J. Immunol., Balt. & Cambridge, Eng., 1920, **5**, 465–488.

The relation of serum proteins to agglutinins in horse, rabbit and goat serum to cholera was studied by precipitating the proteins with ammonium sulphate. 1. Preparation of the saturated solution of ammonium sulphate. Ammonium sulphate was dissolved in distilled water to saturation. Hydroxen sulphide gas was passed to precipitate any iron present, evaporated and made into a heat saturated condition, and cooled to recrystallization by placing in running water. This recrystalization method is repeated 6 times. A saturated solution of the purified crystals is made by taking 20 per cent in excess of 770 grams of the crystals in 1 liter of heated distilled water. Leave at room temperature until no more crystals are seen to go into solution and use the clear supernatant portion as the saturated solution. 2. Separation of the serum protein bodies. The serum diluted 5 times is placed in 3 glasses in volumes of 50 cc. each, the saturated solution of ammonium sulphate is added gradually, while stirring in quantities of 24.62 cc., 24.76 cc., and 28.12 cc. respectively. The precipitates formed are 3 varieties of euglobulin; 3.3 saturation the first, 3.4 saturation the second and 3.6. the third. After 3 hours these are filtered and the process repeated until the filtrates are perfectly clear. Each precipitate is washed with 3.3, 3.4, 3.6 saturation of ammonium sulphate until the solution becomes negative to Spiegler's solution. Each filtrate is centrifuged and 37.31 cc., 37.88 cc., and 39.06 cc. of this clear supernatant liquid is treated with 12.49 cc., 12.12 cc., and 10.94 cc. of saturated aqueous solution of ammonium sulphate by adding the solution gradually while stirring, and the precipitates (the third, the second and the first pseudoglobulins) are filtered repeatedly until perfectly clear. Precipitates thus obtained are dried thoroughly between filter papers and redissolved in distilled water, making up to the original volume. Using methods appropriate to the agglutination test the writer concludes that agglutinins begin to come down at the time when the serum proteins begin to precipitate and are completely precipitated at 4.6 to 4.8 saturation. Agglutinin is present in both euglobulin and pseudoglobulin and never in either exclusive of the other, it is present also in fibrinoglobulin but not in albumin. There is a uniform relationship between the agglutinin and the protein bodies in all animals (horse, goat and rabbit). The presence of ammonium sulphate does not hinder the agglutination reaction, and uniform results are not dependent upon the dilution of the serum at the time of saturation. The difference between the findings here and the results obtained by Pick and others is fully considered.—R. R. H.

992. *Experiments upon the Production of Anti-human Hemolysin with Special Reference to Immunization with Erythrocytes Sensitized with Heated Serum.* Motomatsu Matsumoto. J. Immunol., Balt. & Cambridge, Eng., 1920, **5**, 507–516.

Similar results were produced in influence on body weight, mortality, hemagglutinin and hemolysin production with rabbits treated with unwashed and washed human erythrocytes by intravenous injection at 5-day intervals. Human red cells exposed to anti-human serum diluted 1–10 and heated to 70° to 80° C. reduced their susceptibility to agglutination but increased their susceptibility to hemolysis. Rabbits immunized with these sensitized cells produced results similar to those observed with plain washed corpuscles. Solutions of erythrocytes in distilled water largely free of shadow corpuscles were borne better than the stromata of human erythrocytes injected intravenously. The high mortality among rabbits immunised with human erythrocytes is probably due to direct toxicity of the cells and agglutination and hemolysis *in vivo*, rather than to anaphylaxis.—R. R. H.

993. *A Note on the Non-specific Production of Antibodies.* Motomatsu Matsumoto. J. Immunol., Balt. & Cambridge, Eng., 1920, **5**, 517–519.

Rabbits treated with washed human and sheep corpuscles produced only specific agglutinins and hemolysins for human and sheep corpuscles respectively. The serum was tested against guinea pig corpuscles and *B. typhosus*.—R. R.H.

994. *Agglutination and Sedimentation of Bacteria.* Joseph Vorschütz. Arch. f. d. ges. Physiol., 1921, **186**, 290–298.

Saline suspensions of 10 different organisms of the enteric group—*B. Gärtner, B. Breslau, B. typhosus, B. paratyphosus* A and B, *B. coli, V. cholerae, B. Flexneri, B. Shigae*, and *B. dysenteriae-Y*–were tested for agglutinability by the sera of 39 pregnant women (7th, 8th, and 9th months). Eighteen of the sera gave positive reactions (agglutination in the 1:100 dil.) with cholera, coli, Flexner, and Y strains, and with the other organisms to a less degree. With normal sera, male and female, only negative results were secured. The same bacterial emulsions were tested with sera from the cow, goat, and horse, and it was found that with these sera also only the cholera, coli, Flexner and Y strains were agglutinated, just as the blood corpuscles of these animals when tested in cross agglutionation show the cells of the cow and goat to be as inagglutinable as the 6 refractory bacterial strains. When tested with varying concentrations of histone sulphate all strains were agglutinated, but to varying degrees, the order of susceptibility being cholera, coli, Y, Flexner, Shiga, typhoid, para A, para B, Gärtner, Breslau. With lanthanum nitrate all strains were agglutinated but in varying dilutions, thus cholera still agglutinated in M/2000, Gärtner and Breslau in M/200 and the other 7 in about M/1000. Gelatin acted upon bacterial cells as regards sedimentation as it does upon red blood cells. Bacteria group themselves as regards agglutinability and susceptibility to sedimentation as do the red cells of various animal species, and the substance in pregnant sera which induces sedimentation of blood cells also causes the agglutination of bacteria. Shaking such sera with kaolin, or the addition of narcotics, inhibits both reactions.—G. H. S.

995. *Ricerche sull 'agglutinazione—Azione della corrente eletterica continica sui sieri agglutinanti.* (*Researches on Agglutination—The action of a Continuous Electric Current on Agglutinating Serums.*) P. ZANNELLI. Ann. d.'ig., Roma, 1920, **30**, 405–407.

A current of 8 volts and 0.0005 amperes was passed continuously for 2 hours through a U-tube containing agglutinating serum such as typhoid, paratyphoid A and B, or cholera, the agglutinating titre of which has been previously determined.

Where, before the passage of the electric current, the serum was limpid and neutral in reaction, afterwards it was acid at the anode and had the appearance of a colloid in a state of gelatinization. The portion of the serum at the cathode was decidedly alkalin and turbid.

Serum from both the cathode and anode tested for agglutinin titre, was found negative. Serum from the curve of the tube, the part least affected by the current showed an agglutinating titre practically equal to that of the original serum.

However, equal portions of the serum taken from the cathode and anode, respectively, and mixed, showed an agglutinating titre equal to the original serum. The loss of agglutinating power in the unmixed portions were not due to change in reaction.

The author concludes that agglutinins are divided into two parts by the action of the electric current, neither of which possesses agglutinating power. When mixed in equal portions these two fractions regain the same agglutinating titre as the original serums.—P.M.

996. *On the Results Obtained by the Weil-Felix Reaction for Typhus Fever at the Garrison of Baku during the Period March–July, 1919, Inclusive.* F. E. REYNOLDS. J. Roy. Army Med. Corps, Lond., 1920, **35**, 25.

Agglutination of *B. proteus* X 19 in a dilution of 1:100 is indicative of typhus fever; a negative result in the same titre about 8 days after onset of disease excludes acute typhus. A positive reaction may persist for some months among the convalescent.

Charts of 32 cases of acute typhus, 20 cases of convalescent and 21 cases non-typhus are presented.—W. P. B.

997. *On the Placental Transmission of So-called Normal Antibodies. III. Antilysins.* G. C. REYMAN. J. Immunol., Balt. & Cambridge, Eng., 1920, **5**, 455–463.

The author has been engaged in making observations on the transfer of antibodies from mother to offspring; this paper concerns antilysins.

1. Anti-megatheriolysin. The titre of the blood of the mother goat follows an average constant; which is also true of the kid, but the titre is lower than that of the mother.

2. Anti-vibriolysin. Five kids and their mothers show that the anti-vibriolysin content is the same.

3. Anti-staphylolysin. The maternal sera at the time of parturition contained larger quantities of normal anti-staphylolysin than did the sera of the kids. The titre of the kids increased in most cases during the first days after birth, but soon afterwards it decreased, after which it became more or less constant.

4. Anti-saponin. The titre of the mother animal remains fairly constant, before as well as after parturition, whereas that of the young increases directly after birth until it reaches a higher point than that of the mother, and then as a rule it rapidly decreases.—R. R. H.

998. *Serological Relationships of Liver and Kidney.* MOYER S. FLEISHER, T. G. HALL AND NATALIE ARNSTEIN. J. Immunol., Balt. & Cambridge, Eng., 1920, **5**, 437–453.

The experiment was planned to determine whether or not a difference could be shown between liver and kidney antisera by complement fixation reactions with various antigens before and after absorbing the various sera with cell suspensions of the various organs. Guinea pig organs were used for immunization with rabbits as the source of the antisera. Cross fixation with kidney and liver antigen shows a definite though not absolutely sharply defined tendency toward a differentiation between these two organs. The antigens and antisera are complex in nature and are probably composed of several different partial antigens and immune bodies.—R. R. H.

999. The Antigenic Properties of Globin, with a Note on the Independence of the Properties of Serum and Tissue Proteins, as Exemplified by the Absence of Antibody from the Globin of an Immunized Animal. C. H. Browning and G. Haswell Wilson. J. Immunol., Balt. & Cambridge, Eng., 1920, **5**, 417–428.

The results are summarized in the writers' words.

"1. Globin can act as an antigen. In addition to two antisera for guinea pig's globin, two antisera for ox globin have also been obtained from rabbits. With these antisera and a number of different specimens of the homologous globins powerful complement-fixation reactions have been obtained. The obtaining of the reaction depends on suitable quantitative relationships between antigen and antibody and also, as was shown previously, on a suitable hydrogen-ion concentration.

"2. Only certain rabbits apparently respond to injections of globin by the production of complement-fixing antibodies. The injections of globin caused no obvious toxic effects in rabbits. Hemoglobin seems to elicit antibody production more rarely.

"3. The reactions with antisera show, in certain cases, marked species-specificity of globin; thus the antiserum to guinea pig's globin does not fix complement with ox globin. On the other hand, anti-ox globin fixes complement along with goat, duck and guinea pig globin but not with rabbit globin; no explanation is offered of the contradictory behavior of ox and guinea pig globins in the crossed experiments. But the results taken together seem to exclude bacterial contamination as the cause.

"4. The evidence points to the phenomena being due to a genuine antibody to globin and not to adventitious protein contamination. Further recorded facts (namely, that anti-guinea-pig globin does not contain hemolytic immune body for guinea pig corpuscles and does not react with guinea-pig's hemoglobin, serum or acid serum-albumin, and that guinea-pig's globin does not react with antihuman serum) also exclude theprobable contaminations which arise in the course of preparation of the globin solutions.

"The antibody was absent from the globin of an animal which had reacted to an antigen by the development of powerful serum antibodies."—R. R. H.

1000. Effect of Repeated Bleeding upon Antibody Production. Karl W. Jötten. Arch. Reichsgesundheit., 1920, **52**, 626–635.

The effect of repeated bleeding upon antibody formation was determined in rabbits experimentally immunized with *B. typhosus.* It was found that the repeated withdrawal of blood did not lead to an increase in antibody production (as Hahn and Langer had reported) associated with the increased activity of the blood-forming tissues, when the bleedings were made after the antibody concentration of the blood had reached its maximum. When bleeding was instituted before the agglutinin titre of the serum had reached its highest point an increase in antibody concentration occurred. The effect of bleeding rabbits in which a carrier state had been established showed that these animals developed and maintained an increased titre for a considerable period. This increase is attributed to a lowering of the bodily resistance by the bleeding thus allowing the organisms which had previously been localized in the gall bladder, to re-enter the circulation, thus affording additional stimulation to antibody production. In such carrier rabbits the intracutaneous injection of vaccine virus or the intracutaneous or subcutaneous injection of cow's milk lead to an increase in the amount of circulating agglutinins.—G. H. S.

1001. The Failure of Antibody Formation in Leukemia. K. M. Howell. Arch. Int. Med., Chicago, 1920, **26**, 706–714.

The effect of triple vaccine was tried upon two subjects, one with lymphatic leukemia and one with myelogenous leukemia. Little, if any, increase in amount of agglutinins or opsonins was observed in either case. Temperature and leukocytic reactions are variable.—G. H. R

1002. The Effect of Mustard Gas (Dichlorethylsulphid) on Antibody Formation. L. Hektoen and H. J. Corber. J. Infect. Dis., Chicago, 1921, **28**, 279–285.

Mustard gas administered intravenously to rabbits in amounts from 0.005–0.001 cc. a few days before or coincidently with the intraperitoneal injection of sheep blood, had a restraining influence on the production of specific lysin and precipitin as compared with controls. Given a few days after the injection of sheep blood the effect was less marked. Similar effects were noted upon dogs. Mustard gas profoundly modifies the leucocyte count in dogs as well as in rabbits and human beings. These experiments tend to place mustard gas in the class with the leukotoxic agents: benzene, thorium and the roentgen ray, all of which, though differing in the details of mechanism, have a profound effect on the hematopoietic organs, the leucocytes and specific antibody formation.—L. C. H.

1003. Simplification and Partial Revision of the Factors Involved in the Complement Fixation Test for Infectious Abortion in Cattle. Charles S. Gibbs and Leo F. Rettger. J. Immunol., Balt. & Cambridge, Eng., 1920, **5**, 399–416.

By careful attention to the preparation of the materials it is found that the complement fixation test as applied to infectious abortion is specific, and is a valuable and reliable method of diagnosis. The greatest difficulty apparently encountered with the test is in the preparation of a suitable antigen, which, as the writers show, depends in a large measure upon the media on which the cultures are grown and on the period of incubation. The best antigen was obtained on nutrient agar containing Fairchild peptone, and having an initial hydrogen ion concentration of pH 6.8. The incubation period should not exeed 4 to 5 days, and the stock antigens should be prepared immediately on removal from the incubator, by washing off the slant agar growths of *B. abortus* with relatively small amounts of saline solution. From this stock a dilution is made with carbolized saline to match tube 1.75 of the nephelometer set. An anti-sheep rabbit hemolytic system was used with guinea pig complement.—R. R. H.

1004. Studien über Nukleinwirkung, IV. (Studies on the Activity of Nucleins, IV.) Paul Habetin. Wien. klin. Wchnschr., 1920, **33**, 726–729.

The antigenic properties of sodium nucleinate are considered in relation to the Wassermann reaction. Syphilitic sera show a tendency to bind complement when Na-nucleinate is used as antigen. This closely parallels the Wassermann reaction. Cutaneous and intracutaneous tests with this substance were compared with the tuberculin reaction. The nucleinate produces a primary toxic effect without an incubation period while the tuberculin reaction is different in this respect.—B. C.

1005. Ueber den Einfluss des Antigen-Alkohols auf die Wassermannsche Reaktion. (The Influence of the Alcoholic Content of Antigen on the Wassermann Reaction.) G. Wagner. Ztschr. f. Immunitätsforsch. u. exper. Therapt., I. Teil, Orig., Jena, 1920, **30**, 26–50.

The small amount of alcohol in the organic extract used as the antigen in the Wassermann reaction is by no means a negligible factor in this test. The alcohol, in concentrations of about 9 per cent in the test fluids, exerts a non-specific action upon sera, causing them to become anticomplementary or to fix complement. This effect usually tends to make the fixation of complement in the Wassermann reaction more complete than it would be if the alcohol were not present.—S. B-J.

1006. The Sachs-Georgi Precipitation Test for Syphilis. Thomas G. Hull and Eva E. Faught. J. Immunol., Balt. & Cambridge, Eng., 1920, **5**, 521–527.

This is a precipitation test caused by the mixture of syphilitic serum and cholesterinized antigen. With normal serum no precipitate occurs. The antigen consists of an alcoholic extract of normal beef heart, to each 100 cc. of which is added 200 cc. of alcohol and 13. 5 cc. of a 1 per cent solution of cholesterin. For use, this is diluted 1 to 5 with physiological salt solution. In the test 0.5 cc. is mixed with 1 cc. of serum which has been diluted to 10 cc. with physiological salt solution. The writers have carried out tests on 296 sera with some slight modifications of the method, checked with the Wassermann test and found that the precipitation test agreed with the Wassermann test in 88 per cent of the cases; in 7 per cent it was more delicate; giving positive results where the Wassermann was negative; in 3 per cent it was negative where the Wassermann was doubtful; in 2 per cent it was negative where the Wassermann was positive.—R. R. H.

1007. A Comparison of the Wassermann and Sachs-Georgi Reactions in the Serologic Diagnosis of Syphilis. R. A. Kilduffe. Arch. Dermat. & Syphil., Chicago, 1921, **3**, 415–420.

The technic of Sachs-Georgi test is given and its comparison with the Wassermann test by numerous foreign observers is reviewed.

In 296 parallel reactions, the author encountered non-specific results sufficiently high to make the test unreliable. In some instances it was found positive with Wassermann negative serums and negative with Wassermann positive serums. He concludes that the Sachs-Georgi test is inferior to the Wassermann.—R. D. H.

1008. La reazione de Sacks e Georgi per la diagnosi della sifilide. (The Sachs-Georgi Reaction in the Diagnosis of Syphilis.) P. Pincherle. Policlin., Roma, 1920, **27**, 979–984.

A comparative study was made of the Wassermann and Sachs–Georgi reactions on 600 serums. The latter gave 95 per cent as many positives as the former.

The advantages of the Sachs-Georgi over the Wassermann are as follows: (1) Smaller number of reagents; elimination of guinea pig blood complement, rabbit amboceptor, and sheep corpuscles. (2) Very small quantities of blood are required— 2 cc. (3) The only reagent needed is the cholesterinized alcoholic extract of beef heart. (4) The reaction is completed in one interval of time.—P. M.

1009. La reazione di Wassermann e la reazione di Sachs-Georgi nella sierodiagnosi della sifilide. (The Wassermann Reaction and the Sachs-Georgi Reaction in the Serodiagnosis of Syphilis.) I. Marcora. Policlin., Roma, 1920, **27**, 1107–1113.

The author discusses the Wassermann and the Sachs-Georgi reactions from the standpoint of physical chemistry. The biological activity of serums is influenced by physicochemical factors which modify principally the colloidal state of globulins. Thus, both the Wassermann and the Sachs-Georgi reactions are characterized by a definite change in the serum globulins; in the former it is made evident by the fixation of complement and consequent inhibition of hemolysis and in the latter by a process of flocculation.

Three hundred and one serums were tested simultaneously by the Wassermann and by the Sachs-Georgi reactions and the 2 gave concordant results in 93.6 per cent of the cases. From these results the author concludes that the sensitiveness and specificity of the 2 reactions are equal, and that the Sachs-Georgi reaction has a great advantage over the Wassermann in its simple technic.

Methods are given in detail for preparing the antigen and for carrying on the test.—P. M.

1010. Die Reaktionen nach Meinicke und Sachs-Georgi als Ersatz für die Wassermannsche Reaktion. (The Reactions of Meinicke and Sachs-Georgi as a Substitute for the Wassermann Reaction.) Meyeringh. Ztschr. f. Immunitätsforsch. u. exper. Therap., I. Teil, Orig., Jena, 1920, **30**, 51–76.

The purpose of this paper is to answer the questions as to whether the precipitation reactions of Meinicke and Sachs-Georgi are specific for syphilis and whether they will eventually replace the Wassermann reaction.

About 609 comparative tests of the Wassermann, Meinicke and Sachs-Georgi reactions were done with the sera of 245 patients with various diseases. Of these, 336 were cases of syphilis in various stages, and the rest were miscellaneous diseases. The percentage of positive reactions among all cases were: Wassermann 30.6 per cent, Meinicke 36.6 per cent, Sachs-Georgi 32.3 per cent. These statistics are analyzed to show the results of these tests in various stages of syphilis. The tests gave parallel results, except that the Wassermann reaction proved to be a more sensitive test in the cases of primary syphilis, while the Meinicke and Sachs-Georgi reactions remained positive after the Wassermann reaction had become negative. These precipitation reactions are thought to be as specific for syphilis as the Wassermann test, though occasionally they gave positive results in cases which were not syphilis. At present, neither test is sufficiently accurate, nor free from doubtful interpretation of weak reactions to supplant the Wassermann reaction.—S. B-J.

SERUM THERAPY

(See also Numbers 945, 951)

1011. Standardization of Gas Gangrene Antitoxin. Ida A. Bengtson. Hyg. Lab. Bull. No. 122, Wash., 1920, p. 13–31.

The paper is a report of work done on the production of *B. perfringens* (*B. welchii*), *Vibrion septique* and *B. oedematiens* toxins, and on methods of standardizing and testing *B. perfringens* and *Vibrion septique* antitoxins. The standard adopted for *B. perfringens* antitoxin is as follows:

The unit shall be 1 cc. of the standard serum which is kept in cold storage. To estimate the potency of a commercial antitoxin, the test toxin shall first be standardized by inoculating pigeons intramuscularly with 1/100 unit of standard serum mixed with varying amounts of toxin to determine the smallest dose of toxin which will overcome this amount of serum and kill the pigeon within 24 hours. This dose of toxin, called the "test dose" is usually somewhat greater than 10 minimal lethal doses. The test dose of toxin is then mixed with varying amounts of the serum to be standardized and injected into a second series of pigeons; that amount of serum which gives protection against the test dose shall be considered to contain 1/100 unit.—I. A. B.

1012. Effect of Freezing and Thawing upon the Antibody Content of Antimeningococcus serum. C. T. Butterfield. Hyg. Lab. Bull. No. 124, Wash., 1920, p. 88–89.

The following conclusions are drawn from the results obtained in this study: Freezing and thawing of serum by the slow method has no effect upon its antibody content. The same is true for the freezing and thawing by the rapid method and in the case of one serum tested for a combination of both methods.

When a serum is frozen and thawed slowly without agitation, there is a very slight concentration of agglutinins in the lower levels.

The presence of 0.25 per cent phenol in a serum does not cause the freezing and thawing process to affect the antibody content of the serum.—I. A. B.

1013. Studies on the Lethal Action of some Meningococci on Mice with Special Reference to the Protective Properties of Antimeningococcus Serum. M. H. Neill and Clara E. Taft. Hyg. Lab. Bull. No. 124, Wash., 1920, p. 93–120.

Attempts to increase the virulence of meningococcus cultures by numerous successive passages through mice failed to yield positive results. Even after many passages (41 to 66) all cultures were of rather low virulence, and living and dead organisms showed no very striking difference as far as their fatality for mice was concerned.—I. A. B.

1014. A New Method of Adding Cresol to Antitoxins and Antiserums. Charles Krumwiede and E. J. Banzhaf. J. Infect. Dis., Chicago, 1921, **28**, 367–373.

The addition of cresol to serum forms a precipitate of proteins. The greatest precipitate occurs when the cresol is added rapidly. Addition of dilute cresol tends to dilute the serum. Addition drop by drop with shaking and agitation of the serum increases the chances of contamination. The cresol is bound by the precipitate and there is a question as to how much remains in the serum. This precipitate also adds to the difficulty of filtration.

Equal parts of cresol and ether have been found by the authors to be freely miscible. The rapid addition of sufficient quantities of this mixture to make a concentration of 0.4–0.5 per cent of cresol causes only a slight precipitate. The addition of ether does not produce untoward effects on injection, either subcutaneously, intravenously, intramuscularly or intraspinously. Ageing does not cause an increase of the precipitate over cresol alone, in most cases less. Serum stored without preservative—it is interesting to note—contained twice as much precipitate as other specimens, preserved with even straight cresol. Cultural tests showed that this precipitate is not due to bacteria. The addition of ether increases the bactericidal action of cresol. Occasional specimens of serum contain cresol resistant bacteria which multiply in spite of cresol present in 0.5 per cent concentration. These are killed by the addition of only 0.4 per cent ether. Considerable heat is evolved when cresol and ether mix, a fact which raises the question of a new compound being formed.—L. C. H.

ANAPHYLAXIS

1015. Precipitin Response in the Blood of Rabbits Following Subarachnoid Injections of Horse Serum. HARRY L. ALEXANDER. J. Exper. M., Balt., 1921, **33**, 471–484.

The author found that: (1) Rabbits which have received a single dose of normal horse serum in the subarachnoid space produce precipitins in the blood in greater abundance, of higher titer, and persisting longer than those in control rabbits which have received a similar injection intravenously.

(2) Repeated subarachnoid injection of normal horse serum in rabbits induces precipitins in the blood early. These may appear in high titer as soon as 1 week after the initial injection, whereas in rabbits similarly treated intravenously no precipitins are found at this time. They may appear in a few days afterward and reach a high titer.

(3) No anaphylactic manifestation occurred in rabbits treated repeatedly with subarachnoid injection of normal horse serum when the precipitin content of the blood was high.

(4) Anaphylactins, as determined by passive transfer of anaphylaxis, occurred when an initial intravenous injection of horse serum followed a series of intraspinal injection of such serum.—C. G. B.

1016. Die Aenderung des antitryptischen Titers des Serums bei der Anaphylaxie. II Mitteilung. (The Alteration of the Antitryptic Titer of the Serum in Anaphylaxis. II.) S. RUSZNYAK. Ztschr. f. Immunitätsforsch. u. exper. Therap. I. Teil, Orig., Jena, 1920, **30**, 1–3.

This brief paper recapitulates the author's previous work which showed that the antitryptic titer of the blood serum is increased in anaphylactic shock. He was able to find this, however, in guinea pigs only during the summer months (June, July, August). Apparently the seasonal variations in the metabolic condition of these animals influence the symptoms of anaphylactic shock.—S. B-J.

VACCINE THERAPY

(See also Numbers 886, 967, 975, 981)

1017. The Protective Value of Pneumococcus Vaccination in Mice and Rabbits. AUGUSTUS B. WADSWORTH. J. Immunol., Balt. & Cambridge, Eng., 1920, **5**, 429–435.

Experiments were carried out on mice and rabbits to determine quantitatively the degree of immunity that results after vaccination with a standardized vaccine. Types I, II and III were used. The vaccine was given subcutaneously; the test inoculation of virulent culture, intraperitoneally. The rabbit series was not large as it was found that the protection, which is obtained in these animals, did not differ essentially from that which was obtained in mice, the protection being limited to the infection with the homologous organism. With large doses of vaccine definite protection was obtained against the development of the homologous type of infection, but the degree of protection obtained was not great considering the quantities of vaccine used in immunization. The parasitism of highly virulent cultures is so great that the pneumococci develop in the vaccinated just as they grow in a test tube of immune serum.

Preparation of the vaccine. Meat infusion peptone broth was the medium used with 0.5 per cent glucose. Tubes of dextrose beef infusion broth were inoculated with 0.2 cc. of the most recent semi-solid cultures (1) of the standard strains of pneumococcus Types I, II and III and incubated at 37°C. for 12 hours to be used as seed cultures; the semi-solid cultures having been plated, fished, agglutinated and tested for purity. After incubation, flasks of broth (300 cc. per flask) were inoculated with 1 cc. of the seed culture which had been examined and agglutinated against the 3 types and tested with bile, and incubated at 37°C. for 13 hours. After flasks had been examined for purity they were heated at 53°C. for one-half hour. The heated culture was then centrifugalized for one-half hour. The broth was poured off and a small amount of 0.85 per cent saline was added to the sediment. This suspension was transferred to a sterile bottle to which a definite amount of saline was then added and the mixture thoroughly shaken. One cubic centimeter was removed for bacterial count and the remaining suspension was again heated to 55°C. for one-half hour. The vaccine was standardized by the Helber counting chamber and 0.3 per cent tricresol in a 2 per cent solution was added. Cultural and animal tests were made for sterility and the vaccine was diluted to the desired strength.—R. R. H.

1018. Deterioration of Typhoid Vaccine. G. W. MCCOY AND IDA A. BENGTSON. Hyg. Lab. Bull. No. 122, Wash., 1920, p. 7–12.

Tests were carried out over a period covering 2½ years to determine the rate of deterioration of typhoid vaccines stored at various temperatures, i.e., 5°C., 15°C., 20°C., and 37°C.

Rabbits were injected at intervals with the vaccines and tests made to determine the agglutinating properties of the serum. The results obtained indicate that the rapidity of deterioration is in direct proportion to the temperature above 15°C. Vaccines stored at 37°C. and 20°C. (room temperature) showed marked deterioration in 6 months. Vaccines stored at 15°C. and lower did not show any appreciable falling off in agglutinin producing properties for 15 to 18 months. After 24 months, however, a noticeable deterioration had taken place and this was still more evident after 30 months' storage.—I. A. B.

1019. Potency of Bacterial Vaccines Suspended in Oil (*Lipovaccines*). Ida A. Bengtson. Hyg. Lab. Bull. No. 122, Wash., 1920, p. 33–42.

The preliminary work on the development of methods for testing typhoid and pneumococcus oil vaccines is reported.

The adaptation of the Hygienic Laboratory method for testing saline typhoid-paratyphoid vaccines, i.e., testing for agglutinins in the serum of rabbits injected subcutaneously with these vaccines, did not yield results in the case of the oil vaccines which compared favorably with those obtained with saline vaccine.

Pneumococcus oil and saline vaccines were tested on mice and rabbits and the results obtained indicate that a certain amount of protection was afforded by both though the saline vaccine was rather more effective than the oil vaccine in these animals.—I. A. B.

1020. Ueber die Typhusschutzimpfung. (*On Typhoid Vaccination.*) A. Wolff-Eisner. Ztschr. f. Immunitätsforsch. u. exper. Therap. I. Teil, Orig., Jena, 1920, **30**, 4–26.

This report is a refutation of Friedberger's recent unfavorable criticism of the results of typhoid vaccination. In the first place, the author shows that when typhoid vaccination was begun in the German army in October, 1914, the disease was not then on the decline, as Friedberger stated, but was increasing. He then describes two explosive outbreaks of typhoid fever among troops in the trenches in the Vosges. In these small epidemics, the disease could not be checked by the ordinary sanitary measures, but stopped abruptly after the soldiers were vaccinated against typhoid.—S. B-J.

1021. Fundamento del tratamiento par las vacunas en la blenorregia y sus complicaciones. (*The Fundamentals of the Treatment by Vaccines of Blennorrhagia and its Complications.*) Perez Grande. Semana méd., Buenos Aires, 1920, **27**, 28.

The author reports that urethral discharges containing typical gonococci often suddenly develop in people who have had no suspicious sexual relations. Furthermore, in cases of chronic gonorrhea he has found a semispherical Gram-positive organism which grows readily on ordinary media but has the property of producing gonorrhea in man. This organism can be changed into a typical gonococcus by cultural methods and vaccine made of the organism effects a cure in cases with chronic urethral discharges.—C. G. B.

1022. Ueber Herstellung und Anwendung von Impfstoffen zur Behandlung bakterieller Krankheiten. (*The Preparation and Use of Vaccines for the Treatment of Bacterial Diseases.*) Hans Seebohm. Centralbl. f. Bakteriol. (etc.), I. Abt., Orig., Jena, 1920, **84**, 479–486.

The author considers vaccine therapy in its relationship to colon, typhoid, paratyphoid and dysentery bacilli and to infections with streptococcus, staphylococcus, and micrococcus and gonococcus. The use of diphtheria vaccine to clear bacillus carriers of their organisms is also discussed. It was found that within 2 weeks 53.5 per cent of those treated specifically had become free of bacteria, in 3 weeks 77.11 per cent and within 4 weeks 89.5 per cent. In 27 cases colon bacilli present in the urine were eliminated as follows: Within from 5 to 18 days in 10 cases, 25 to 30 days in 7 cases, 35 to 45 days in 5 cases and after 54, 56, 62, and 71 and 87 days, respectively, each of the other 5 cases.—R. E. B.

NONSPECIFIC THERAPY

(*See also Number 1042*)

1023. Antigeno-terapia paraspecifica di alcune malattie infettive nell 'infanzia. (*Antigen-Therapy as Paraspecific in Certain Diseases of Infancy.*) F. Valagussa. Policlin., Roma, 1920, **27**, 361–394.

Valagussa deals at length with the theory of non-specific protein therapy, and gives much evidence in its support. Good results were obtained by the author in the treatment of typhoid fever among children with peptone according to the method of Nolf; also in influenza with non-specific horse serum. It was also shown by experimental evidence that yeast (*S. cerevisiae*) autolysate when injected into guinea pigs increases the leucocytes and the mobile defenses of the organism.

In his deductions and conclusions the author states in part as follows: Commercial peptones, horse serum, and enzymes, are 3 types of antigens which when inoculated in the organism induce a paraspecific defense useful in combatting infectious diseases. The behavior of each is identical, the only difference is in the degree of intensity of phenomena which they may provoke, being more intense with peptones and serum, less intense with yeast autolysate. The ultimate results are the same; they diminish the activity of the germs and increase the activity of the leucocytes.

Yeast autolysates have distinct advantages over serums and peptones in that they do not give anaphylactic phenomena, but only local reactions, and as antigens contain an albuminoid, lipoid, and carbohydrate groups. They are very active, least toxic, and easily administered intramuscularly or intravenously.—P. M.

EXPERIMENTAL INFECTION

(*See also Numbers 963, 973, 1013*)

1024. *The Etiological Relation of Bacillus actinoides to Bronchopneumonia in Calves.* Theobald Smith. J. Exper. M., Balt., 1921, **33**, 441–469.

A detailed pathological and bacteriological study of an outbreak of pneumonia in calves is given. *Bacillus actinoides* (previously described) is definitely associated with the disease as an etiological factor. *Bacillus pyogenes*, *Bacillus bovisepticus*, staphylococci and streptococci may appear in the affected lungs. Subcutaneous injection of *Bacillus actinoides* produced in calves large indurations ending in necrosis; intratracheal injection, circumscribed necrosis of the lungs.—C. G. B.

1025. *Experimental Syphilis in Rabbits. VI. Affections of Bone, Cartilage, Tendons and Synovial Membranes.* Wade H. Brown, Louise Pearce and William D. Witherbee. J. Exper. M., Balt., 1921, **33**, 495–538.

This report is divided into three parts: (1) Lesions of the skeletal system; (2) clinical aspects of syphilis of the skeletal system, affections of the facial and cranial bones and the bones of the forearm; and (3) syphilis of the posterior extremities with other affections of a miscellaneous type.

The authors' summary: "A systematic study was made of the affections of bone, cartilage, tendons, and synovial membranes which occurred in a series of rabbits with generalized syphilis. Localized infection of this group of structures was found to be of very frequent occurrence. The parts involved were, in the order of the frequency, the facial and cranial bones and cartilages, the bones, tendons, and joints of the feet and legs, the cervical and caudal vertebrae, the ribs, and the sternum. These infections often gave rise to characteristic manifestations of disease which could be detected without difficulty by inspection or palpation of the part. In many instances, however, clinical manifestations were so slight the presence of lesions could be detected only by radiographic or pathological examination.

"Detailed descriptions of various clinical types of disease were given and the clinical manifestations correlated with the pathological process. It was pointed out that bone lesions exhibited a decided predilection for certain exposed bony prominences, for lines of bony union, and for epiphyseal lines in particular.

"A study of the clinical history of bone lesions brought out the fact that they were among the earliest of the generalized forms of disease; they tended to pursue a comparatively rapid course, and relapse was never observed. Especial emphasis was laid upon three aspects of the experimental infection: the analogy existing between certain forms of the animal and human affections, the relation of syphilis of the osseous system to other evidences of disease, and the occurrence of obscure bone lesions.

"In this connection, it was pointed out that the nasal and epiphyseal lesions of the rabbit presented a striking analogy to those of congenital syphilis in man.

"It was also pointed out that syphilis of the osseous system occupied a definite position in the scheme of defensive reactions such that lesions of these tissues might be favored or inhibited according to the experimental conditions employed.

"Finally, the frequency with which infections occurred which were not accompanied by sufficiently distinctive signs even to suggest the possibility of their existence was interpreted as evidence that some cases of latent or obscure infection in man might find their explanation in the presence of a similar group of affections."—C. G. B.

1026. *On the Reaction of Pregnant and Lactating Females to Inoculation with Treponema pallidum.* W. H. Brown and L. Pearce. Am. J. Syphilol., St. Louis, 1920, **4**, 593–597.

It was determined that there was a distinct difference in the reaction of pregnant rabbits to inoculations of *Treponema pallidum* from that of normal rabbits similarly injected. This difference extends through pregnancy and well into the period of lactation.

Two extremes of reaction were noted. In one type no clinical sign of infection appears which indicates a defensive mechanism of the pregnant animal toward inoculations at the time of conception. However, slight local lesions and marked constitutional disturbances are produced in other instances which suggest a decreased resistance to the infection.—R. D. H.

1027. *Changes in the Leukocytes and the Alkali Reserve of the Blood in Experimental Infections.* Edwin F. Hirsch. J. Infect. Dis., Chicago, 1921, **28**, 275–278.

Intravenous injections into rabbits were made of the following cultures: *B. typhosus*, *B. dysenteriae*, *B. coli*, *Streptococcus hemolyticus* and *viridans*, *B. diphtheriae*, *B. pneumoniae* and *B. welchii*. The alkali reserve was determined according to the method of Van Slyke and Cullen. There usually occurred, within a period of 2 to 4 hours following the injection, a leucopenia and a diminution of the alkali reserve. A rise of leucocytes and a return to normal of the alkali reserve follows. There may be a short period of alkalosis. Continued low alkali reserve is accompanied by leucocytosis. With a rise to normal there is a decline in the leucocytes. It is suggested that diminution of alkali or the factors associated with it may afford the chemical stimulus necessary for the subsequent leucocytosis.—L. C. H.

CHEMOTHERAPY

(*See also Numbers 895, 896, 916, 947, 750, 977, 988, 1035*)

1028. Fractionation of Chaulmoogra Oil. Arthur L. Dean and Richard Wrensall. Pub. Health Rep., Wash., 1921, **36**, 641–660.

The paper describes a method for obtaining the active principle of chaulmoogra oil which has been used successfully in the treatment of leprosy. After several years' experience with the ethyl esters of the fatty acids of chaulmoogra oil the hypothesis appears justified that the fatty acids of the chaulmoogra acid series are specific for the disease. They are readily absorbed from intramuscular injections and therefore in a suitable form for treatment. —I. A. B.

1029. Klinische Erfahrungen mit Flavizid. (*Clinical Results with Flavicide.*) Hans Langer. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1143–1144.

Flavicide (2, 7-dimethyl-3-dimethylamino-6-amino-10-methyl-acridinium chloride) is considered an effective therapeutic disinfectant. It is non-toxic to a high degree, does not lose its effectiveness in the presence of serum and is highly active against Gram-positive organisms, especially diphtheria bacilli.—B. C.

1030. Colloidal Arsenic. Fritz Külz. Arch. f. exper. Path. u. Pharmakol., 1921, Leipz., **89**, 111–143.

The chemical and physical properties of colloidal as are described in detail, as well as the pharmocologic action of the compound. It acts much as arsenious acid, but modifies the blood picture after a somewhat different manner. It is as effective as As_2O_3 in the treatment of mice infected with *Trypanosoma brucei*, *T. equiperdum*, and *Spirocheta recurrentis*. —G. H. S.

MISCELLANEOUS

1031. A Study of the Mechanism of Human Isohemagglutination. Herbert L. Koeckert. J. Immunol., Balt. & Cambridge, Eng., 1920, **5**, 529–537.

By a method that may be considered a fractional absorption of agglutinins from so-called polyvalent serums and the fractional saturation or combination of receptors of polyvalent cells, it can be shown that there are two distinct normal human isohemagglutinins and two agglutininogens, which operate to produce the group distribution of human bloods.—R. R. H.

1032. Serious Reactions to Repeated Transfusions in Pernicious Anaemia. H. M. Bowcock. Johns Hopkins Hosp. Bull., Balt., 1921, **32**, 83–93.

Bowcock concludes that in certain patients suffering from pernicious anemia after repeated transfusion this method of treatment becomes self-limited because of the inadequacy of the methods for selecting suitable donors; that the severe reaction is probably due to an anaphylactic manifestation rather than to hemolysis *per se:* that blood matching should be carried out with the greatest care and whenever possible the incubation period should be at least 2 hours or longer; that blood serum free from cellular elements may produce bone-marrow stimulation; and that members of Group IV can not be regarded absolutely as universal donors.—F. W. H.

1033. Condition of the Capillaries in Histamine Shock. A. R. Rich. J. Exper. M., Balt., 1921, **33**, 287–298.

An attempt was made to determine the local action of histamine on the capillaries of the living omentum but the unavoidable manipulation of the omentum gave rise to such a marked dilatation of the capillaries that the effect of local irritants was obscured. By fixing the omentum *in situ* it was readily demonstrated that the local application of histamine causes a marked dilatation of the capillaries through which the blood flow is very sluggish. It is concluded that the circulatory failure which characterizes histamine shock results from a dilatation of the peripheral vascular bed.—C. G. B.

1034. Granules in the Cells of Chick Embryos Produced by Egg Albumin in the Medium of Tissue Cultures. Margaret Reed Lewis. J. Exper. M., Balt., 1921, **33**, 485–493.

Granules develop in the cytoplasm of the cells of chick embryo connective tissue cultures when grown in egg white or a dilution of egg white in Locke-Lewis solution. These granules can be readily distinguished from degeneration vacuoles, mitochondrial bodies and neutral red granules. The egg white is not as good a medium as Locke-Lewis solution, the cultures are less extensive and do not live so long. The mechanism of the formation of the granules was not determined.—C. G. B.

1035. The Effect of Body Cells and Fluids on Certain Dyes. T. D. BECKWITH. J. Infect. Dis., Chicago, 1921, **28**, 170–175.

An attempt to determine the processes by which dyes are removed from the circulation following intravenous injection. Cell suspensions, defibrinated blood, oxalated blood, serum, and bile were tested against a large number of dyes. When brought in contact with brain, bile and serum little change takes place in the dye. Certain secreting and filtering tissues, such as the liver, kidney, bone marrow and spleen showed a high degree of activity. Lung and muscle occupy an intermediate position. Acriflavine and proflavine showed no change with any tissues or fluids. It is concluded that dyes are removed from the circulation through the agency of cell structures, tissue cells being the active agents rather than blood corpuscles. The particular tissue instrumental in the removal varies with the dye in question. Separation of the dye from its solution in the serum is brought about by adsorption on cell surfaces with no vital staining evident at the concentrations used. Stains thus removed by adsorption are destroyed. This destruction continues to the production of the leukobase in a few instances, but in the majority of instances it extends to the formation of products further removed from the original chemical structure.—L. C. H.

1036. The Fate of India Ink Injected Into the Blood. II. The Formation of Intracellular Granules and Their Movements. K. NAGAO. J. Infect. Dis., Chicago, 1921, **28**, 294–316.

Particles of India ink seem to be absorbed by certain elements in the cells, probably granules, and a capsule of ink particles is formed which is designated the primary granule. Cells which have absorbed ink particles tend to disintegrate soon and the ink granules mix with the debris and undergo modification. New polymorphonuclear cells are supplied by the marrow and in from 6 to 12 hours after the injection of the ink, new cells with immature basophilic granules appear in the blood. Later these cells are also seen to contain ink granules liberated in the destruction of the phagocytes. Repetition of this process results in irregular accumulations of ink masses. The injection into the peritoneal cavity of chemotactic solutions results in the attraction of cells with few granules only; apparently phagocytes stuffed with granules do not migrate and ink leucocytes which form in the peritoneal cavity do not return to the blood. Ink granules are transferred only in small degree to the blood and form primary granules in the cells of the liver, spleen and other organs.—L. C. H.

1037. Entgiftung von Lösungen durch Hefe und andere Mikroorganismen, Enzyme, Proteinstoffe. (The Use of Yeasts and other Microorganisms, Enzymes and Protein Substances to Free Solutions from Poisons.) TH. BOKORNY. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1920, **52**, 26–39.

Since yeasts and other microorganisms combine with acids and bases making them inactive, and since they also form salts with mercury, silver, copper, zinc, lead and other metals, it is suggested that the introduction of yeast (eventually also proteins, enzymes) into the digestive tract may serve the purpose of neutralizing the poisons in the stomach and intestine. —S. A. W.

1038. The Relation of Pathologists to the Institutional Practice of Medicine. WILLIAM CARPENTER MACCARTY. J. Lab. & Clin. M., St. Louis, 1921, **6**, 331–334.

The author had the following objects in presenting this paper:

"1. To show pathologists (including bacteriologists, serologists, immunologists, and other workers in pathology) the economic part which they should play in the practical consideration of patients.

"2. To show clinicians that laboratory investigators can, and sometimes do, play an important rôle in the practice of medicine.

"3. To assist in bridging the gap which now exists between what has been called pure science and its practical application to patients.

"4. To suggest the great probability that some of the most important fields of scientific research may be found in direct connection with the study of patients.

"5. To relieve the minds of young aspirants in research from the conception that the most fundamental research must of necessity be carried on in isolated research institutions." —F. W. H.

1039. La catástrofe del Vitalismo. Una Nueva era para la ciencia y la humanidad. (The Catastrophy of Vitalism.) ALFONSO L. HERRERA. Semana méd., Buenos Aires, 1920, **27**, 20–23.

A method for the production of artificial cells is described: A solution of potassium silicate is put between two glass slides and potassium fluoride is added in certain quantities (not given in this article). The slides are pressed well together and brought in contact with a collodion sack containing a solution of calcium chloride and then covered with a bell jar to prevent evaporation. Within a few hours or days the cell structures are formed.

These artificial cells very closely resemble animal cells, all structures (nucleus, granules, filaments and cell membrane) being present. New cells arise from parent cells, the division resembling karyokinesis.—C. G. B.

SCIENTIFIC PROCEEDINGS OF THE LANSING BRANCH, SOCIETY OF AMERICAN BACTERIOLOGISTS

JANUARY, 1921

1040. Some Bacteriological Problems Involved in the Retting of Flax. ZAE NORTHRUP WYANT.

A review was given of the fiber flax cultivation in the United States; structure of the flax stem; a description of the two main retting processes, involving (1) aerobic and (2) anaerobic organisms with specific examples of each, including a brief description of the Amerlin Company's mill at Port Huron; the various aerobic and anaerobic pectin-dissolving organisms isolated by different investigators; and lastly, of the few experiments performed by the writer, using water from various sources and pure cultures of aerobes or facultative anaerobes isolated in different experiments, together with a review of the bacteriological problems involved.

The problems suggested are more or less local. The amounts and kinds of minerals in the available waters must be determined and the water "doctored" if it is not possible to obtain a suitable natural water, these kinds and amounts having to be determined for each locality. In a few tests made by the writer, the water from the Red Cedar River was found to give better results than did tap, distilled, or cistern water, as judged by the quality of fiber. For example, fiber from flax retted in distilled water was very harsh. Mixtures of waters gave varying reults. Perhaps the reason that the river water gave such good results was because of the large amount of sewage it contains. This is one of the reasons given for the good results obtained from retting flax in the River Lys in Belgium. This point has not yet been determined.

Another problem is the comparison of fiber from the same flax retted aerobically and anaerobically under otherwise identical conditions. The writer used both processes, not comparing them, however, but deciding to work with aerobic and facultative anaerobic conditions since the anaerobic fermentation is accompanied by such a vile odor.

It is still a question whether or not it is advantageous to use pure cultures. About 40 cultures, aerobes and facultative organisms, were isolated, representing the predominant types on the pectin agar plates made from many and varied experiments. Many of these organisms are probably identical. Each of the cultures was tested on a small scale for its retting power and for quality of fiber, using tap water as the easiest source of supply. One of the cultures giving the best results was used on a larger scale to get comparative results. None of the organisms were identified; however, some were observed to be spore-formers. A few types as determined by their growth on pectin agar, seem to predominate in all flax retted without the addition of cultures, whatever water or mixture of waters was used. Experimentally retted flax fiber was exhibited.

The test of any flax retting process is the quality, quantity, length, tensile strength, etc. of the fiber obtained and any combination which does not approach the maximum in all respects, or reach the optimum may as well be discarded. This suggests, however, an almost endless number of cooperative experiments for any one locality, and when one or more combinations prove satisfactory experimentally, it still remains to be determined whether the methods can be made practical from the economic standpoint so that they can be put to commercial use.

The bacteriologist does not as yet have to compete with the chemist in retting the flax fiber as is the case with that of hemp, and certain other fiber plants, but this is no excuse for his neglecting the field altogether. Not until the bacteriologist shows that flax retting can be successfully and rapidly carried out on a large scale in various localities where the fiber is or may be grown, will the fiber flax industry reach old world proportions.—*Author's abstract.*

1041. A Bacteriological Study of a Typhoid Outbreak. C. C. YOUNG AND M. CROOKS.

In the latter part of October, 1920, the writers were called upon to investigate a typhoid outbreak at Hillsdale, Michigan. An epidemiological survey indicated that the infection was being disseminated by a single milk supply. One of the employes had recently suffered from an undetermined fever, consequently Widal tests and feces examinations were made on all those connected with the dairy. The Widal reactions did not point to a definite source of infection, but feces examinations disclosed one member of the organization—not the one suspected of having had typhoid—to be a carrier of *B. typhosus*.

Although epidemiologically this finding indicated the cause of the outbreak, it was important to prove that the typhoid organism obtained from the carrier was similar in its serological and sugar reactions to those isolated from the patients infected with typhoid. Agglutination and absorption studies were thereupon carried out as well as sugar reactions on maltose, mannite and xylose.

It was found that 16 out of 20 strains isolated from different typhoid patients, agglutinated in the same dilution (1–5000) of antityphoid serum as the carrier strain, and of the remaining 4, 3 were partially agglutinated in this dilution and 1 showed partial agglutination in 1–2500. A serum absorption test carried out with the carrier strain showed complete absorption of agglutinins when tested against each of the other 20 strains. A study of the fermentative reactions, further showed that all of the Hillsdale strains were xylose fermenters.—*Author's abstract.*

May, 1921

1042. An Outbreak of Chicken Diarrhea Treated with B. sanguinarium and Anti-Typhoid Serum. S. R. Johnson.

In a recent outbreak of diarrhea among 1 to 2 weeks old chicks (including both the light and heavy breeds), which the writer was called upon to investigate, no organism could be isolated which pointed to the cause of the outbreak.

As the color and consistency of the droppings simulated those found in fowl-typhoid of older birds, *B. sanguinarium* suggested itself as the causative agent. Muslow had shown that this organism belonged to the paratyphoid group, and it appeared that a vaccine of this organism might help check the epizootic. The death rate was averaging 35 to 40 per cent and haste was necessary.

Accordingly vaccine treatment with *B. sanguinarium* was instituted. The vaccine consisted of a heated broth culture of the organism, and the quantities injected (subcutaneously) ranged between 0.125 to 0.25 cc. The immediate effect of the injection appeared to be highly toxic to the chicks. This, however, lasted only between 15 and 30 minutes. Complete recovery usually took place between 24 and 48 hours after injection. Prophylactic vaccination was also instituted effectively.

The probability that we were dealing with an infection caused by an organism related to the typhoid-paratyphoid group, suggested also the employment of anti-typhoid serum in some of these cases. It was found that 0.5 cc. quantities of anti-typhoid serum injected subcutaneously, gave parallel results with the vaccine, except that the toxic action was not encountered. Prophylactic injection of serum also gave favorable results. The total number of chicks injected with either vaccine or serum was 700, and with these treatments the death-rate was reduced from 35–40 per cent to about 15 per cent. In view of the fact that the death-rate of normal chicks is in the neighborhood of 15 per cent, it appears that these substances possessed marked prophylactic and curative effects.—*Author's abstract.*

1043. A New Upright Counting Apparatus for Plate Cultures. Zae Northrup Wyant. Plates 1 and 2.

The apparatus here described consists of a piece of board 18 cm. square, and from 1 to 1.3 cm. thick, in which a slot is cut about 10 cm. in diameter, large enough to accommodate the ordinary 10 cm. diameter Petri dish. The portion of the block at the lower end of the slot, is purposely extended somewhat so that the apparatus may be clamped on a ring stand at any desired level. A "universal" clamp gives a great latitude of adjustment. On the front of the slotted board is hinged a door containing the ruled counting plate, ruled side in, figure side up. This door has a latch. On the back of the board is fixed a square of clear glass the same size as the counting plate, the frame being held to the board with stiff springs for the purpose of holding the Petri dish tightly in place. At the lower end of the slot a separate piece (either wood or metal) curved to conform to the Petri dish, is fastened to a rod set vertically in the block of wood. This piece raised or lowered by a thumb screw working on the rod is for the purpose of centering the Petri dish culture with the counting plate.

To use this counting apparatus it is only necessary to unlatch the door, insert the Petri dish, bottom side toward the counting plate, close and latch the door, adjust the plate to the lighting (if necessary) and proceed with counting, using a lens or not, as desired. The ruled side of the counting plate, being next to the bottom of the Petri dish, makes it possible to focus the counting lens simultaneously on the rulings of the counting plate and the colonies on the Petri dish. The springs fastened to the clear glass plate enable any thickness of Petri dish within ordinary limits, to be used, the pressure of the door closing upon the Petri dish being sufficient to push out the springs and hold the dish firmly in place.

The top portion of the frame of both the clear glass and the counting plate is easily removable so that should the glass be broken, it could be replaced in a few minutes.—*Author's abstract.*

1044. A Simple Cremator. Zae Northrup Wyant. Plate 3.

This apparatus is for the purpose of eliminating the chance of scattering living bacteria through "sputtering" when sterilizing moist or oily inoculating needles contaminated with pathogens. The "cremator" consists of a galvanized iron cylinder about 30 cm. high and 6.5 cm. in diameter, the seam riveted about every 3 centimeters, and the floor, also of galvanized iron, containing a circular opening of sufficient size to admit a Bunsen or other burner, crimped on. Around the base of the cylinder is clamped a strap of galvanized iron with 3 legs (strap and legs in one piece) of sufficient spread and curvature to give a stable base, raising the cremator to a height sufficient (11 to 12 cm.) to enable the burner to be adjusted without burning the operator, and also to prevent the legs from becoming so hot as to burn the laboratory desk or table.

When transfers of cultures are to be made the cremator is placed over the burner. The burner is then lighted (from the top of the cremator) and very soon the walls and floor of the cremator become exceedingly hot from the heat reflected. When a moist, or oily inoculating needle is inserted in it for sterilization, the infectious material which spatters or drips from it is immediately and effectually destroyed as it hits the heated walls or floor.—*Author's abstract.*

1045. A Study of the Hydrogen-Ion Concentration of Different Kinds of Glassware When Sterilized With Buffered and Non-buffered solutions. FREDERICK W. FABIAN AND ROSS C. STULL.

1. Glassware taken from stock, filled with a non-buffered solution, as conductivity water, and autoclaved for 30 minutes at 15 pounds pressure yielded enough alkali to change the reaction of the conductivity water from pH 7.0 to pH 9.8.

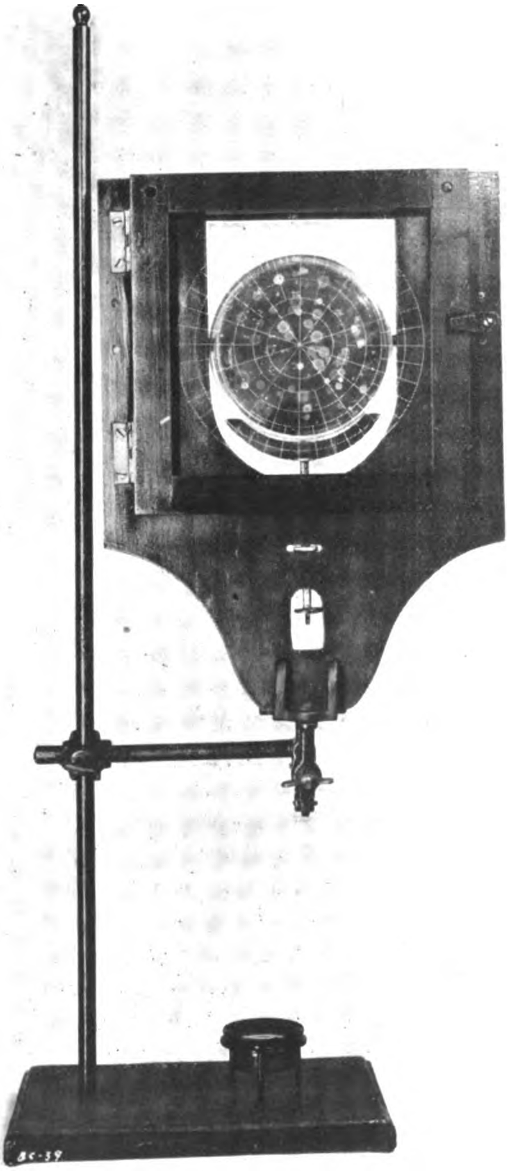
2. The amount of alkali yielded by this same glassware was not sufficient to change the reaction of a buffered solution, as nutrient broth. In fact the nutrient broth with a reaction of pH 7.0 before autoclaving had a reaction in some cases of pH 6.8 after autoclaving in this glassware.

3. Soft glassware yields more alkali upon autoclaving than does hard glassware.

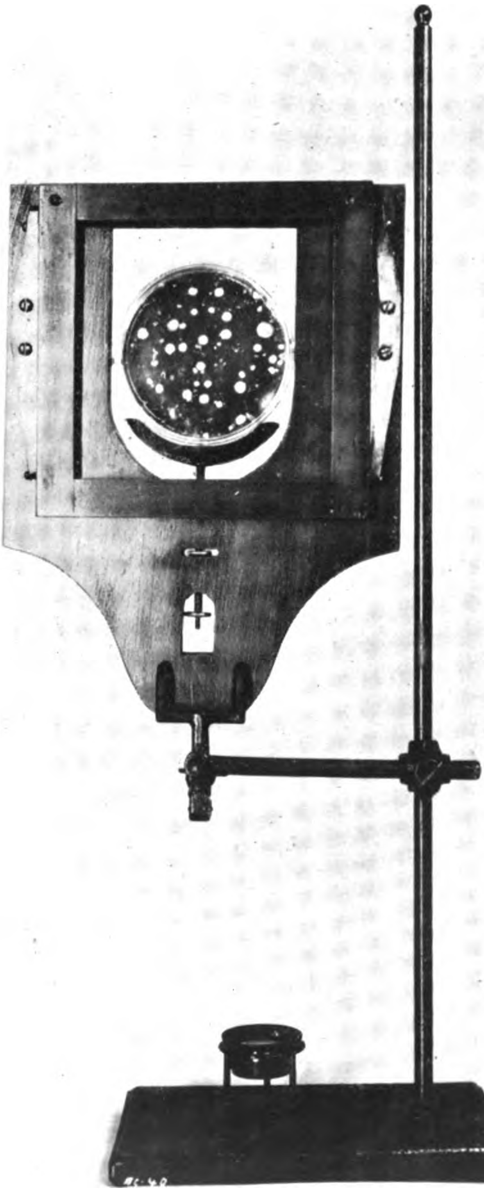
4. Glassware treated with cleaning solution (60 grams potassium dichromate, 60 cc. sulphuric acid, and 1000 cc. water) still gives off alkali after being autoclaved. In some cases the cleaning solution destroyed or neutralized substances that interfered with the action of the indicator.

5. The practice of adding cleaning solution to new glassware before using is recommended.

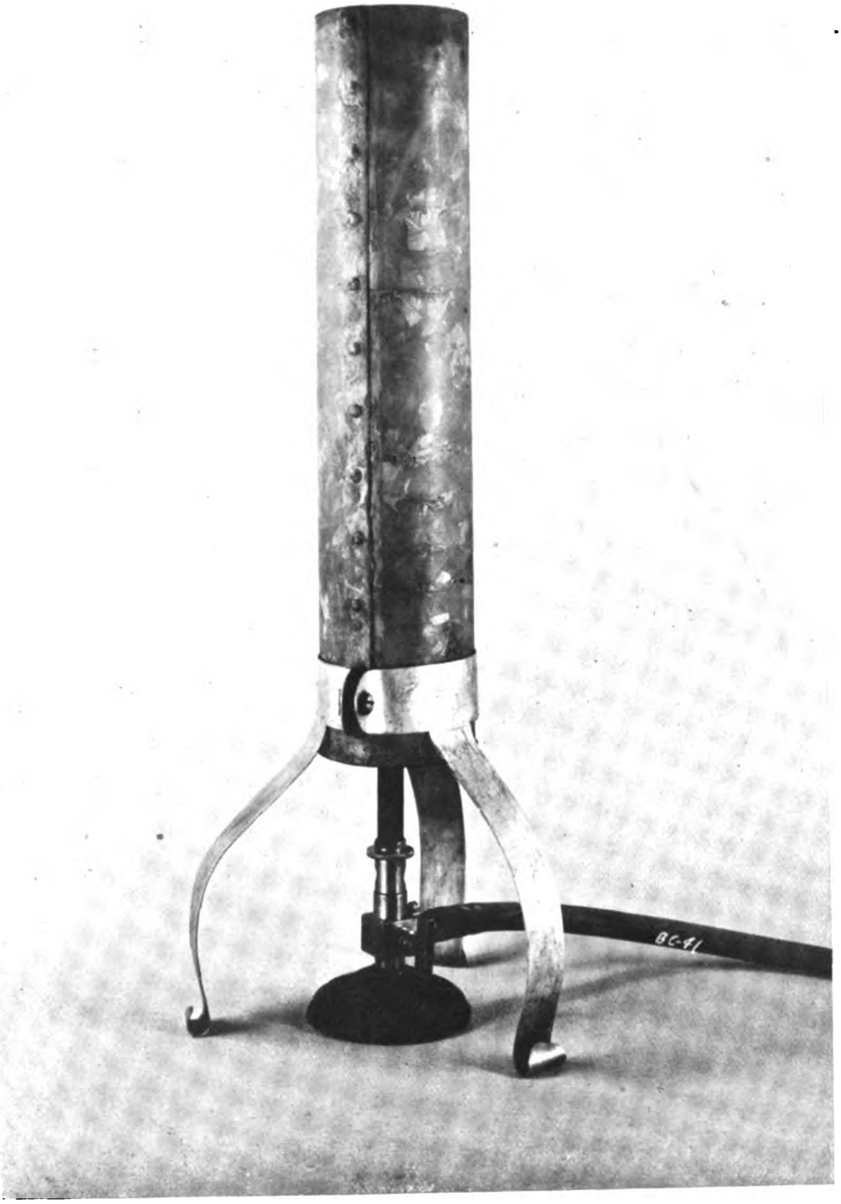
6. Laboratory workers should also bear in mind that when working with non-buffered solutions, the alkali yielded by the glassware may be sufficient to change the results considerably.—*Author's abstract.*



Upright Counting Apparatus—Front View



Upright Counting Apparatus—Back View to Show Springs



A Simple Cremator

The Subject Index for Volume IV will be published in an early issue

VOLUME V NUMBER 7

ABSTRACTS
OF
BACTERIOLOGY

UNDER THE EDITORIAL DIRECTION OF THE
SOCIETY OF AMERICAN BACTERIOLOGISTS

JULY, 1921

EDITOR
A. PARKER HITCHENS

It is characteristic of Science and Progress that they continually open new fields to our vision.—PASTEUR

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ABSTRACTS OF BACTERIOLOGICAL LITERATURE

CHARACTERIZATION AND CLASSIFICATION

(*See also Number 1410*)

1236. *Contribution à étude de l'acidorésistance du Bacille de Koch en culture homogène.* (*Contribution to the Study of the Acid Resistance to the Bacillus of Koch in Homogenized Cultures.*) PAUL SPEHL. Compt. rend. Soc. de biol., Par., 1921, **84**, 835–839.

A detailed study was made of the influence of culture media, method of preparing smears, technic of fixation, and procedure for staining, in their effects upon the acid-fastness of *B. tuberculosis*. Among the factors which determine the acid resistance are: age of the culture; action of the medium upon the organisms during the different stages of growth; the temperature of fixation; and the composition of the culture medium, particularly its content of glycerol.—G. H. S.

1237. *Types de Bacilles diphthériques et épidémiologie.* (*Types of Diphtheria Bacilli and Epidemiology.*) PAUL DURAND AND JEAN GUERIN. Compt. rend. Soc. de biol., Par., 1921, **84**, 980–981.

Agglutination and agglutinin absorption experiments have divided *Bact. diphtheriae* into at least 5 serologic types. Several localized familiar outbreaks of diphtheria were studied with reference to the type of organism causing infection and the constancy of the type in the different cases of the disease. Usually all cases are infected with the same type. In a small epidemic occurring in a school all of the cases were infected with the same type (I) and from all of the carriers in association with the cases Type I was isolated.—G. H. S.

1238. *Propriétés charactéristiques de races de Colibacilles proprement dits prélèves sur les animaux a sang chaud et a sang froid.* (*Characteristic Properties of Races of True Colon Bacilli Obtained from Warm Blooded and Cold Blooded Animals.*) ERIK BONDO. Compt. rend. Soc. de biol., Par., 1921, **84**, 421–423.

Numerous races of *B. coli* were isolated from warm blooded animals and from fish. All of the strains, except two which did not grow at 37°C., reacted positively in glucose media with methyl red. Other reactions of acidity production were conducted without showing any fundamental differences which could be associated with source. Indol production was of interest: 34 of the 39 strains from warm blooded animals gave indol; 23 of 29 races from cold blooded animals did not, and the other 6 of the strains of this group gave weak or inconstant results.—G. H. S.

1239. *Ueber Varianten des Bacterium enteritidis Gärtner.* (*Variants of Bacterium enteritidis Gärtner.*) THEODOR GRUSCHKA. Wien. klin. Wchnschr., 1920, **33**, 964–965.

Variants with altered serological behavior were cultivated from four Gärtner strains. Type I variant was derived from all four original strains, and showed absence of the labile H-receptor. Type II variant, also derived from all the original strains, showed the acquisition of a new, stable receptor in addition to the typical labile one. One of the Gärtner strains produced a variant (Type III) which possessed only a newly acquired stable receptor. Several of Type I remained true to type after more that 40 transfers in agar and bouillon, while others reverted to the normal. Types II and III did not revert at all during the time of observation. —B. C.

1240. *Sur le Bacille de Morgan.* (*The Bacillus of Morgan.*) A. BESSON AND LAVERGNE. Compt. rend. Soc. de biol., Par., 1921, **84**, 530–532.

A serological study of several strains of *B. morgani* showed that within the group antigenic differences exist.—G. H. S.

NEW SPECIES

(*See Numbers 1288, 1372*)

BACTERIAL NUTRITION AND METABOLISM

(*See also Numbers 1332, 1333, 1377*)

1241. *Culture de Spirochaeta icterohemorrhagiae en milieu vitaminé.* (*The Cultivation of Spirochaeta icterohemorrhagiae in Vitamine Medium.*) G.-J. STEFANOPOULO. Compt. rend. Soc. de biol., Par., 1921, **84**, 813–814.

The medium is an extract of blood cells. The addition of a small amount of rabbit serum greatly favors growth.—G. H. S.

1242. Culture et conservation des microbes sur les milieux a la levure autolysée. (Cultivation and Conservation of Bacteria upon Media Containing Autolysed Yeast.) G. Abt and G. Blanc. Compt. rend. Soc. de biol., Par., 1921, **84**, 452–453.

The medium is prepared as follows: Brewers' yeast is carefully washed and the dry weight of an aliquot portion is determined. The yeast is then digested for 24–36 hours at 48–50°C. in saline in such concentration that the yeast is present in 8–10 per cent. Two volumes of water are added and after heating to boiling the mixture is filtered. After neutralization the filtrate is sterilized at 115°C. for 15 minutes, and again filtered. A portion of the filtrate is evaporated to dryness to give a basis for measurement and the filtrate is made into 2, 1, or 0.5 per cent bouillon. After the addition of agar a final sterilization at 110°C. is given. One kg. of dried yeast will yield 60–70 litres of 1 per cent bouillon.

Such a medium is well adapted to the cultivation of *B. typhosus*, the paratyphoids A and B, *B. dysenteriae*, *B. anthracis*, *B. pyocyaneus*, streptococci, the bacillus of Friedländer, *V. cholerae*, and the bacillus of Preisz-Nocard. Cultures remain viable upon this medium for at least 3 months. Other organisms were tried but they failed to grow abundantly.—G. H. S.

1243. A propos de l'action des sels de terres rares sur les cellules microbiennes. (The Action of Salts of the Rare Earths upon Bacterial Cells.) Pierre Girard. Compt. rend. Soc. de biol., Par., 1921, **84**, 442–444.

The salts of the rare earths exert profound physical and chemical effects upon living cells. In ordinary bouillon the value of σh is about 3.7×10^{-6} C.G.S. When lanthanum ions are added to the medium to such concentration that the value of σh falls to about 2.5×10^{-6} hypervegetation results; further addition of La (to a value of 1.8×10^{-6}) causes a decrease in the activity of the life processes and the viability of the single cell is greatly prolonged. A pneumococcus which in ordinary bouillon at 10°C. would remain alive for only 3 days maintained its viability without loss of virulence for 6 weeks in La bouillon (σh of 1.8 or 1.2×10^{-6}) at 0°C. Apparently the condensation of protoplasm renders the organism extremely resistant to lytic processes and the entire bacterial cell seems to function as a spore. Other experiments were conducted with *B. shigae*, *B. typhosus*, the paratyphoids A and B, asporogenous *B. anthracis*, *Vibrion septique*, and the bacillus of Preisz-Nocard.—G. H. S.

1244. Sur la teneur en materiès grasses des Bacilles tuberculeux des types humain, bovin, avaire. (The Content in Fatty Substances of the Tubercle Bacilli of the Human, Bovine and Avian Types.) Albert Frouin. Compt. rend. Soc. de biol., Par., 1921, **84**, 606–608.

The amount of material recovered from *B. tuberculosis* by fat solvents has varied according to different investigators from 8 to 46 per cent. Various solvents used under diverse conditions have been employed, but the type of bacillus, the age of the culture and the composition of the medium upon which it has been cultivatd have usually been disregarded.

A strain of *B. tuberculosis* was grown upon glycerin broth and the growth was washed and dried to constant weight. Extraction by the Kumagawa-Suto method using different solvents gave: with petroleum ether 6.72, sulfuric ether 28.5, acetone 26.5, chloroform 21.82, and absolute alcohol 35.34 per cent. Bovine bacilli (mixture of 3 strains) extracted with alcohol gave a yield of 35.52 per cent, human bacilli (2 strains) gave 29.81 per cent. Human, bovine, and avian strains were cultivated on a medium composed of dipotassium phosphate, magnesium sulfate, sodium citrate, asparagin, and glycerol. In other tests various sugars were added, or substituted for the glycerol. Cultures grown for a month upon such media gave:

	Asparagin and glycerol	*Asparagin glycerol and glucose*	*Asparagin mannit and glucose*
Bovine strains	22.95	23.10	12.99
	45.51	43.85	12.99
	42.86	45.51	8.55
Human strain	19.59	21.32	6.75
Avian strain	40.10	39.23	14.22

The effect of the glycerol is noteworthy, and the comparison of the fat and wax content of human and bovine bacilli grown under identical conditions suggests that this chemical factor may be associated with the virulence of the strains for laboratory animals.—G. H. S.

1245. Tuberculine et milieux de culture du Bacille tuberculeux. (Tuberculin and Culture Medium for the Tubercle Bacillus.) Albert Vaudremer. Compt. rend. Soc. de biol., Par., 1921, **84**, 775–776.

A potato bouillon medium is described. Tubercle bacilli grow very rapidly upon it; the organisms secured cause no local inflammatory reaction after they are heated; and in the medium no tuberculin is formed.—G. H. S.

1246. Ueber Ersatz der Nutrose in Bakteriendifferentialnährböden. (Substitute for Nutrose in Bacterial Differential Media.) J. Leuchs. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1415–1416.

Alkali albuminate prepared from beef or horse serum is a satisfactory substitute for nutrose in the preparation of Barsiekow's media.—B. C.

1247. Contribution à l'étude des milieux vaccinés. (*Vaccinated Media.*) René Pierret. Compt. rend. Soc. de biol., Par., 1921, **84**, 903–904.

A renewal of the study of media "vaccination." *B. typhosus* was cultivated on agar for 24 hours and after the removal of the growth the agar was melted, slanted, and reinoculated with *B. typhosus*, the paratyphoids A and B, and *B. coli*. The organisms failed to grow or grew less abundantly; thus demonstrating a "co-vaccination." Heterologous organisms, as *B. anthracis*, staphylococoi, could be cultivated on a medium previously used for typhoid. Other experimental work along the same line is recorded.—G. H. S.

1248. Ein neuer, besonders für die Züchtung von Gonokokken geeigneter Gehirnnährboden. (*A New Brain Medium Especially Suitable for Cultivation of Gonococci.*) Alfred Pettersson. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1385.

The brain of a new-born dead human fetus is aseptically removed to a sterile, covered jar. Sterile ascitic fluid is added and the jar shaken for an hour, after which it is placed in the ice-box. After several hours solid material has settled out leaving an opalescent fluid on top. The latter, when mixed with 3 per cent agar, is an excellent medium for gonococci. Growth is improved when dextrose is added.—B. C.

1249. Sur la forme et la culture du Bacterium coli et d'autres microbes sur gélose minéralisée lactosée. (*The Morphology and Cultivation of B. coli and other Bacteria upon Lactose "Mineralized" Agar.*) H. Kufferath. Compt. rend. Soc. de biol., Par., 1921, **85**, 16–18.

Upon the medium which has been described previously, different strains of *B. coli* present different characteristics; some strains assuming very long flexuous forms, others acquiring the characteristics of cocco-bacilli. *B. prodigiosus* grows fairly well on the medium, without the development of pigment, in the form of short rods with rounded ends. *B. fluorescens liquefaciens* grows poorly and does not give fluorescent pigment. Many degenerative forms are found, which stain poorly and the bacilli assume a dumb-bell shape. *B. aerogenes* does not grow well. The rods occur singly or in pairs, and have rounded ends. Many of the individuals are coliform. *B. typhosus* does not give abundant growth; the bacilli are short and rarely filamentous. *B. paratyphosus* A hardly grows at all and the few organisms which develop are short resembling cocci. *B. paratyphosus* B grows delicately with short non-coliform rods and a few filamentous involution forms. *B. pyocyaneus* grows feebly but the bacillary form is maintained. *B. pestis* grows with difficulty and the organisms resemble diplococci. *B. dysenteriae* Shiga does not give a heavy growth but the organisms are thick, and are sometimes very filamentous. Flexner and Strong varieties of *B. dysenteriae* give light growths composed of short forms and of extremely long bacillary filaments. The Hiss strain resembles cocco-bacilli. *V. cholerae* maintains its normal morphology but grows lightly. Non-pathogenic actinomyces do not grow readily. The medium is considered of value in separating *B. coli* from other forms.—G. H. S.

1250. Sur la production de phenol par le Bacille tetanique et le Bacille pseudotetanique. (*The Production of Phenol by the Tetanus Bacillus and the Pseudotetanus Bacillus.*) M. Rhein. Compt. rend. Soc. de biol., Par., 1921, **84**, 561–563.

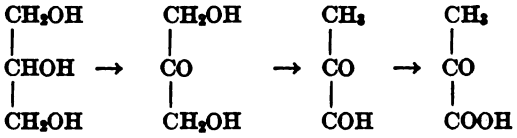
From 3 specimens of garden soil 3 strains of what appeared to be the same organism were isolated and all produced phenol in considerable amounts. Morphologically the organisms could not be distinguished from *B. tetani* but culturally they resembled tetanus only in part and they failed to produce toxin. The organism is considered to be identical with the *B. pseudotetani* described by Robertson. Subsequent experiments showed that both *B. tetani and B. pseudotetani* produce phenol.—G. H. S.

1251. Ueber Verlust des Gasbildungsvermögens bei Bakterien der Paratyphusgruppe. (*The Loss of Gas Producing Properties of Bacteria of the Paratyphoid Group.*) Tsakalotos. Schweiz. med. Wchnschr., 1921, No. 11, 250–252.

Prolonged cultivation changed the fermentative reactions of certain strains of *B. paratyphosus* B. Pure lines carried through many generations and derived from a plating of the original culture showed that some of the lines lost fermentative powers, others did not. All such races were, however, serologically reactive as para B.—G. H. S.

1252. Oxidation de la glycérine par le Bacillus subtilis. (*Oxidation of Glycerin by the Bacillus subtilis.*) E. Aubel. Compt. rend. Soc. de biol., Par., 1921, **84**, 574–576.

Glycerol decomposition by *B. subtilis* was studied in a medium composed of asparagin, dipotassium phosphate, magnesium sulfate, and glycerol. The processes of oxidation are indicated as



$$\begin{array}{lclclcl} CH_2OH & & CH_2OH & & CH_3 & & CH_3 \\ | & & | & & | & & | \\ CHOH & \rightarrow & CO & \rightarrow & CO & \rightarrow & CO \\ | & & | & & | & & | \\ CH_2OH & & CH_2OH & & COH & & COOH \end{array}$$

—G. H. S.

1253. Sur las production de races asporogènes de Bactéridie charbonneuse. (*The Production of Non-Sporulating Strains of the Anthrax Bacillus.*) G. ABT. Compt. rend. Soc. de biol., Par., 1921, **84**, 627–628.

Cultures of *B. anthracis* free from spores were secured by daily transplantation of the strains on a potato bouillon containing 4 per cent glycerol. From 10 to 17 passages are necessary. This method appears to be more satisfactory than any of the other procedures advocated.—G. H. S.

THE D'HERELLE PHENOMENON—BACTERIOPHAGE

1254. Sur l'historique du bactériophage. (*The History of Bacteriophage.*) F. D'HERELLE. Compt. rend. Soc. de biol., Par., 1921, **84**, 863–864.

The nature of the paper is indicated by the title. Mention is made of the work of Hankin in 1896 and of Twort in 1915.—G. H. S.

1255. Phénomènes coïncidant avec l'acquisition de la résistance des bactéries a l'action du bactériophage. (*Phenomena Coincident with the Acquisition of Resistance of Bacteria to the Action of Bacteriophage.*) F. D'HERELLE. Compt. rend. Soc. de biol., Par., 1921, **84**, 384–386.

When *B. shigae* is placed in combination with *Bacteriophagum intestinale* certain morphological changes in the organisms present in the medium become apparent. Contrary to previous opinions these forms are not stages is the life cycle of *Bacteriophagum intestinale* but are rather involution or resistant forms of the Shiga bacillus. This conclusion is reached from having tested the pathogenicity and serologic relationships of the forms in question. —G. H. S.

1256. Rôle du bactériophage dans l'immunité. (*Rôle of Bacteriophage in Immunity.*) F. D'HERELLE. Compt. rend. Soc. de biol., Par., 1921, **84**, 538–540.

When the host is offering resistance to an infecting agent, bacteriophagous principles directed against this agent can be isolated from the intestinal contents. The use of such bacteriophagous principles experimentally in overcoming infection is recorded, together with some theoretical data on the significance of such agencies in immunity.—G. H. S.

1257. Sur le sérum anti-bactériophage. (*Anti-bacteriophage Serum.*) F. D'HERELLE AND G. ELIAVA. Compt. rend. Soc. de biol., Par., 1921, **84**, 719–721.

Rabbits were injected with 4 doses of an emulsion of *B. shigae* which had been lysed by the bacteriophage, and 8 days after the last injection the serum was tested for antilytic action. The presence of 1 part in a million of this serum prevented the bacteriophage from acting upon the Shiga strain. The serum is merely inhibitory, it does not destroy the bacteriophage. Such a serum also exerts an anti-immunizing action. When an amount of dysentery toxin equal to one-tenth of a fatal dose for a normal mouse is injected into a mouse along with one-fifth of a cubic centimeter of the antibacteriophagous Shiga serum death follows within 30 hours.—G. H. S.

1258. Sur la nature du bactériophage. (*The Nature of Bacteriophage*). F. D'HERELLE. Compt. rend. Soc. de biol., Par., 1921, **84**, 908–909.

From additional experiments the author affirms that the bacteriophage can be nothing but an ultramicroscopic parasite of bacteria. The bacteriophage is living matter.—G. H. S

1259. Evolution des cultures de coli lysogène. (*Development of Cultures of Lysogenic Colon Bacilli.*) J. BORDET AND M. CIUCA. Compt. rend. Soc. de biol., Par., 1921, **84**, 747–748.

A culture of *B. coli* subjected to the lytic action of its bacteriophage becomes heterogenous in nature, some organisms resist the lytic principles better than the normal colon bacillus, others are sensitive. Colony formation of these organisms also differs.—G. H. S.

1260. Guérison et retour a l'état primitif par le sérum antilytique du coli lysogène. (*Recovery and Return to the Former Condition through an Antilytic Coli-lysogenic Serum.*) J. BORDET AND M. CIUCA. Compt. rend. Soc. de biol., Par., 1921, **84**, 748–750.

The sera from rabbits immunized with *B. coli* previously subjected to the lytic bacteriophagous agent are of high antilytic potency. When colon organisms that have been modified by exposure to the lytic agency are treated with this antilytic serum the organisms recover their normal susceptibility to the bacteriophage.—G. H. S.

1261. Remarques sur l'historique des recherches concernant la lyse microbienne transmissible (*Remarks upon the History of Researches concerning Transmissible Bacterial Lysis.*) J BORDET AND M. CIUCA. Compt. rend. Soc. de biol., Par., 1921, **84**, 745–747.

The question of priority of publication on the subject of the bacteriophagous virus is discussed and it is pointed out that the work of Twort antedated by two years that of d'Herelle. —G. H. S.

1262. L'autolyse transmissible du staphlocoque et l'action coagulante des cultures lysées. (*Transmissible Autolysis of the Staphylococcus and Coagulating Action of Lysed Cultures.*) André Gratia. Compt. rend. Soc. de biol., Par., 1921, **85**, 25–26.

A lytic substance opposed to the growth of the staphlococcus is described. A sterile filtrate prepared from lysed staphlyococci has the property of coagulating oxalated plasma, whether it has been hirudinized or not.—G. H. S.

1263. De l'adaptation héréditaire du Colibacille à l'autolyse microbienne transmissible. (*Hereditary Adaptation of the Colon Bacillus to Transmissible Bacterial Autolysis.*) André Gratia. Compt. rend. Soc. de biol., Par., 1921, **84**, 750–751.

The resistance of *B. coli* to the autolytic agent does not offer an example of inheritance of an acquired characteristic, but is simply an instance of the persistance of certain members of a culture capable of resisting the unfavorable conditions imposed by the circumstances of the experiment.—G. H. S.

1264. Dissociation d'une souche de Colibacille en deux types d'individus de propriétés et de virulence différentes. (*Dissociation of a Strain of Colon Bacillus into Two Individual Types with Different Properties and Virulence.*) André Gratia. Compt. rend. Soc. de biol., Par., 1921, **84**, 751–753.

The strain of *B. coli* used by Bordet and Ciuca can be subdivided into two races, one very resistant, the other very susceptible, to the lytic bacteriophagous substance. In addition to the differentiation of the two races upon the basis of vulnerability there are other characters which the races do not hold in common. Manner of growth differs as well as the rapidity of growth. The resistant race is also much more virulent for guinea pigs.—G. H. S.

1265. De la signification des "colonies de bactériophage" de d'Herelle. (*The Significance of Bacteriophagous Colonies of d'Herelle.*) André Gratia. Compt. rend. Soc. de biol., Par., 1921, **84**, 753–754.

The observations of d'Herelle are explained in part, at least, by the presence of differently resisting races of *B. coli* in the culture employed by him.—G. H. S.

1266. Sur la spécifité du principe lytique. (*The Specificity of the Lytic Principle.*) André Gratia. Compt. rend. Soc. de biol., Par., 1921, **84**, 755.

The lytic principle is more powerful and less specific if it is related to a strain of *B. coli* which is resistant than if it is related to a sensitive strain.—G. H. S.

1267. Sur les caractères nouveaux présentés par le Bacille de Shiga ayant résisté à l'action du bactériophage de d'Herelle. (*New Characters of the Shiga Bacillus after Having Resisted the Action of the Bacteriophage of d'Herelle.* G. Eliava and E. Pozerski. Compt. rend. Soc. de biol., Par., 1921, **84**, 708–710.

After *B. shigae* has been in contact with the bacteriophagous principle directed against it, the following characters are presented: When grown in boullion turbidity does not occur; normal strains cloud the medium. Upon shaking, a diffuse clouding appears but this quickly sediments. Microscopically the organisms tend to assume a cocco-bacillary form. Agglutinability is diminished; with a given serum the normal strain is agglutinated in a dilution of 1: 400, the treated strain only to 1: 20. Treated strains become resistant to the bacteriophage, and this increased resistance persists through several generations.—G. H. S.

1268. Au sujet de la nature au principe bactériophage. (*The Nature of the Bacteriophagous Principle.*) J. Maisin. Compt. rend. Soc. de biol., Par., 1921, **84**, 467–468.

By dialysis experiments, with the bacteriophagous ferment within the capsule and bouillon without, it was shown that the substance in question is of colloidal nature. The addition of a culture of bacteria susceptible to lysis by the bacteriophagous principle to the bouillon without the dialysing sac showed that none of the active agent passed through. The active principle is precipitated by saturation with ammonium sulfate.—G. H. S.

1269. Adaptation du bactériophage. (*Adaptation to Bacteriophage.*) J. Maisin. Compt. rend. Soc. de biol., Par., 1921, **84**, 468–470.

The bacteriophagous ferment prepared after the method of Bordet and Ciuca is active against the colon bacillus of d'Herelle and against certain races of the colon-typhoid-dysentery group. Other strains, resistant at first to the ferment, by adaptation become susceptible. Shiga strains are the most susceptible. A specificity, or elective activity, in bacteriophagous ferments is demonstrated; one ferment acting upon Shiga and not on the bacillus of d'Herelle, and another presenting exactly opposite activities.—G. H. S.

1270. Au sujet du principe bactériophage et des anticorps. (*The Bacteriophage Principle and Antibodies.*) J. Maisin. Compt. rend. Soc. de biol., Par., 1921, **84**, 754–756.

Rabbits were immunized with the bacteriophage specific for *B. coli* (d'Herelle) and for *B. shigae*. The antisera produced failed to show specificity of action.—G. H. S.

1271. Au sujet des microbes devenus résistants au principe bactériophage. (*Bacteria Having Become Resistant to the Bacteriophage Principle.*) R. Bruynoghe and J. Maisin. Compt. rend. Soc. de biol., Par., 1921, **84**, 847–848.

A culture of organisms which are resistant to the bacteriophage virus is really a complex culture, containing more than one type of organism as regards reactivity to the virus.—G. H. S.

1272. Au sujet de la guérison des germes devenus résistants au principe bacteriophage. (*The Recovery of Bacteria Having Become Resistant to the Bacteriophage Principle.*) R. Bruynoghe. Compt. rend. Soc. de biol., Par., 1921, **85**, 20–23.

The elements of culture which resist the action of the bacteriophage may lose this property of resistance. Spontaneous regression to normal forms may occur, or they may lose their resistance by contact with an antilytic serum or with a normal rabbit serum.—G. H. S.

PHYSICAL CHEMISTRY

(*See also Number 1448*)

1273. Spectre ultra-violet des pigments du Bacille pyocyanique. (*Ultraviolet Spectrum of the Pigments of Bacillus pyocyaneus.*) Cluzet, Rochaix and Kofman. Compt. rend. Soc. de biol., Par., 1921, **84**, 403–405.

The spectra of the pyocyaneus pigments—pyocyanin, green fluorescent pigment, melanogenic pigment, and erythrogenic pigment—were studied. Pyocyanin gave a sharply delimited absorption band between 3880 and 3580 Angstroms. Its width amounted to 300 A., its center at 3730 A. The green fluorescent pigment gave a band of 670 A., its center at 3915 A. The erythrogenic and melanogenic pigments completely adsorbed the ultra-violet.—G. H. S.

1274. Sur le pullulation des microbes et la destruction des phagocytes, dans le champ de rayonnement diffusément caustique des foyers radio-actifs faiblement ou non filtrés. (*The Growth of Bacteria and the Destruction of the Phagocytes in the Diffusely Caustic Field of Irradiation of Radio-Active Foci Inadequately or not Filtered.*) Antoine Lacassagne. Compt. rend. Soc. de biol., Par., 1921, **84**, 861–862.

Treatment with rays may readily destroy the tissue cells without exerting the slightest abiotic effect upon bacteria. In fact such tissue destruction may actually favor the development of septic conditions.—G. H. S.

BACTERIOLOGICAL TECHNIC

(*See also Number 1479*)

1275. Hémocultures rapides par ensemencement de sang désaléxiné. (*Rapid Blood Cultures by Planting Inactivated Blood.*) Ranque and Senez. Compt. rend. Soc. de biol., Par., 1921, **84**, 799–800.

Even in septicemias of about the same degree, the time of appearance of the growth in blood cultures varies to a considerable extent. While usually positive (*B. typhosus* or paratyphoid) after an incubation of 36 to 40 hours, it is not unusual to encounter a latent period of 48 to 72 hours. Probably one of the most important determining factors is the presence of antibodies in various concentrations in the serum. From this point of view, experiments were made with the idea of shortening the period intervening before diagnosis could be made. After the blood was taken into bouillon, antihuman amboceptor was added and the complement was thus exhausted. In a series of 14 positive blood cultures (pneumococcus, 1; *B. paratyphosus* B, 2; *B. typhosus*, 11) two sets of blood cultures were made at the same time. The set which had been deprived of complement showed growth more quickly than the other set; usually some 20 hours earlier.—G. H. S.

1276. A propos d'une méthode de mise évidence des Bacilles de Koch après décoloration par le sulfite de soude. (*A Method for Demonstrating the Bacillus of Koch after Decolorizing with Sodium Sulfite.*) J. Gate, Papacostas and Lacoste. Compt. rend. Soc. de biol., Par., 1921, **84**, 405–406.

The method proposed offers but questionable advantages over that of Ziehl-Hauser.—G. H. S.

1277. Nouveau colorant pour les grains de Neisser des Bacilles diphtériques. (*A New Strain for Neisser Granules in the Diphtheria Bacillus.*) Constant Peeters. Compt. rend. Soc. de biol., Par., 1921, **85**, 15.

The stain is composed of two basic dyes and is prepared as follows: 5 grams of iodin green is dissolved in 1000 cc. of distilled water and 0.5 cc. of an alcoholic solution (saturated) of aniline red is added. With this stain, applied for ½ to 1 minute, the bacteria are a bluish green and the granules are a red-purple.—G. H. S.

1278. Méthode pour la numération microscopique des bactéries. (*Method for Counting Bacteria.*) Hans Heckscher. Compt. rend. Soc. de biol., Par., 1921, **84**, 1039–1040.

A method for direct counting is described.—G. H. S.

1279. Un nouveau liquide d'immersion. (A New Immersion Fluid.) VILHELM JENSEN. Compt. rend. Soc. de biol., Par., 1921, **84**, 424–425.

The paraffin oil suggested as a substitute for oil of cedar as an immersion oil has an index of only 1.471 while to secure the best results it should have an index of 1.515. The desired index of refraction can be secured to the paraffin oil by adding to 76 parts of the oil 24 parts of a-bromnaphthaline. These proportions are not absolute but hold only for particular lots of the chemicals, although this ratio will approximate the desired results. The mixture does not injure the lens nor react with the ordinary stains.—G. H. S.

1280. Extraction de ferments cellulaires. (Extraction of Cellular Ferments.) R. TURRO. Compt. rend. Soc. de biol., Par., 1921, **84**, 375–377.

Tissues were dehydrated, dried, and pulverized, and then extracted in chloroform water. The hydrolytic activity as well as the bactericidal action of such extracts for *B. anthracis* was determined.—G. H. S.

1281. Examen sur fond lumineux à l'ultramicroscope. (Examination with the Ultramicroscope Using a Luminous Background.) G. PROCA. Compt. rend. Soc. de biol., Par., 1921, **84**, 1027–1028.

Bacterial capsules upon living organisms can be demonstrated by the ultramicroscope by suspending the organisms in an optically active material, such as India ink.—G. H. S.

INDUSTRIAL BACTERIOLOGY

1282. Les bactéries des latex. (Bacteria of Latex.) C. PICADO. Compt. rend. Soc. de biol., Par., 1921, **84**, 552.

The latex of *Pedilanthus tithymaloïdes* Poit. contains an abundant bacterial flora. The author asks whether the organisms play any part in the production of diastases in the latex, or if it would be possible to modify the nature of the rubber by inoculating the latex with selected types of bacteria.—G. H. S.

FERMENTATION INDUSTRIES

1283. The Acetic Organisms. J. MEZZADROLI. Pure Products, 1921, **5**, 216–218.

The coccus and diplococcus-like organisms which make up the film found on the surface of alcoholic liquids will change usually to rod forms if cultivated in neutral or feebly alkaline liquids. If, however, they are transferred to acid media they again appear in the coccus form. Alcohol is not necessary for the multiplication of acetic organisms. They also attack nitrogenous matter which they are able to degrade to a low form. The wide dissemination and many sided chemical activities of this group lead to the view that perhaps they have a much more important rôle in the economy of nature than that usually assigned to them. It is not always easy to isolate and grow them in a pure state, as they do not accustom themselves quickly to laboratory media. Good strains often become contaminated with undesirable organisms. In many vinegar factories the *Bacterium xylinum* is present and produces large layers of gelatinous membrane. Success in vinegar plants depends upon pasteurisation of liquids awaiting acetification, cleanliness of the plant including fermenting vessels and casks and the proper regulation of temperatures.—E. L.

MYCOLOGY

(See also Numbers 1300, 1417)

1284. Sur les lichens vitricoles. (Window Lichens.) ETHEL MELLOR. Compt. rend. Soc. de biol., Par., 1921, **84**, 650–651.

The lichens which have been found upon windows and which may cause deterioration are listed:

Bacomyces rufus, var. *prostii* (Duf.).
Ramalina polymorpha, var. *lingulata*, (Ach.).
Xanthoria parietina, var. *tumida* (Wedd.), and var. *ulophalla* (Malbr.).
Placodium murorum, var. *cinnabarinum* (Oliv.), and var. *subcitrinum* (Nyl.).
Diploicia canescens (Ach.).
Caloplaca pyraces, var. *pyrithoma* (Nyl.).
Lecania erysibe, var. *olivacella* (Nyl.).
Rinodina exigua, var. *pyrina* (Ach.).
Pertusaria leucosora (Nyl.), and *Pertusaria lutescens* (Th. Fr.).
Biatorina erysiboides (Nyl.).
Buellia alboatra, var. *glaucoatra* (Nyl.).
Opegrapha saxatilis (D. C.) and *Opegrapha rupestris* (Pers.).
Arthopyrenia chlorotica, var. *olivacea* (Borr.).
Lepraria flava (Ach.) and *Lepraria chlorina* (Ach.).

Usually these lichens grow only upon the exterior of the window but some forms live upon the inner side as well. The effect of the color of the glass upon the lichens is undetermined as is the exact chemical nature of the process which leads to the deterioration of the glass.—G. H. S.

1285. Note sur trois espèces de levures du jus de cajou, fruit d'Anacardium occidentale. (*Three Species of Yeast from the Juice of the Cashew, Fruit of Anacardium Occidentale.*) FROILANO DE MELLO. Compt. rend. Soc. de biol., Par., 1921, **84**, 997.

An excellent alcohol, which can be secured by fermentation on a commercial scale, is derived from the fruit of *Anacardium occidentale.* Three new types of yeast have been found in connection with the fruit juice. Description is given of these forms, which are designated *Endomyces anacardii, sp. n.; Parasaccharomyces giganteus, sp.n.;* and *Atelo saccharomyces moachoi, sp. n.*—G. H. S.

1286. Sur quelques levures du Cocotier (*Cocos nucifera*). (*Some Yeasts from the Juice of the Cocoa Tree.*) FROILANO DE MELLO. Compt. rend. Soc. de biol., Par., 1921, **84**, 584–586.

Sura is a juice derived from the palm trees of Portugese India, and from this extract are made alcohol, vinegar, and a sugar. From this sura 17 different strains of yeasts were isolated. The morphological characteristics and fermentative reactions of the strains are given, and they are classified as belonging among the *Saccharomyces, Saccharomycodes, Atelo saccharomyces, and Zymonema.*—G. H. S.

1287. Étude d'un Champignon nouveau appartenant au genre Oöspora (*Tribu des Solidae de Guéguen*). (*A New Mold Belonging to the Genus Oöspora.*) A. SARTORY. Compt. rend. Soc. de biol., Par., 1921, **84**, 939–941.

Two organisms were isolated from the sputum of a patient suspected of pulmonary tuberculosis; *Oïdium lactis* and an undescribed form of the genus *Oöspora.* The morphology and characters of growth are described. Biochemically, it liquefies gelatin, coagulates milk in 10 days with precipitation and peptonization of the casein, does not give indol, does not break down glucose, galactose or levulose, but does ferment saccharose. Rabbit, guinea pig, and mouse inoculations were negative.—G. H. S.

1288. Un nouvel Hyphomycète, le Cladobotryum capitatum. (*A New Hyphomycete, Cladobotryum capitatum.*) L. RAYBAUD. Compt. rend. Soc. de biol., Par., 1921, **84**, 798–799.

A description of the organism.—G. H. S.

SOIL BACTERIOLOGY

1289. The Effect of Organic Nitrogenous Compounds on the Nitrate Forming Organism. E. B. FRED AND A. DAVENPORT. Soil Sc., Balt., 1921, **11**, 389–404.

This paper represents a study of the effect of organic nitrogenous compounds on the growth and oxidizing power of the nitrifying organisms. Enriched soil cultures from various soil types were used after 50 subcultures were made. When grown on washed nitrite agar and slants of Nahrstoff-Heyden agar with and without nitrite present, the oxidizing powers of the organism were retained. Peptone beef infusion or Nahrstoff-Heyden solutions failed to grow nitrobacter. The former medium proved toxic in higher concentrations, while the latter was non-toxic. Furthermore the organisms did not multiply in water, urine, peptone, beef infusion, or Nahrstoff-Heyden with the possible exception of the latter according to the microscopical examination. The harmful agent was present in beef infusion in small amounts since dilution with water removed the toxic effect. The nature of the toxin is not known except that it is non-volatile, as shown by steam distillation, and is removed by extraction with ether or alcohol.

Nitrate formers will live 2 to 6 weeks in a 1 per cent solution of Nahrstoff-Heyden, gelatin, peptone, casein, yeast water, milk, and distilled water, while in 1 per cent beef extract they are killed rapidly. Oxidation of nitrites in cultures to which small amounts of organic nitrogen are added, takes place rapidly; in the case of Nahrstoff-Heyden this oxidation takes place more rapidly than in water controls. Gelatin, peptone, casein, skim-milk, beef infusion, and beef extract, showed no injury. Asparagin, ammonium sulfate and urea retarded oxidation.

Contrary to Beyerinck and others in the literature, these authors find no support for the statement that the nitrate-forming organism loses its powers of oxidation in the presence of certain organic compounds and find in fact that some of these are often beneficial. Nitrobactor grows scantily on nitrite agar slants and this growth is found to produce greater oxidation than that resulting from the use of liquid nitrite cultures. Mention is made of the fact that sealed nitrite agar slants have been kept for more than a year without serious injury to oxidizing power.—N. K.

1290. Nitrogen from the Air. J. G. HUTTON. S. Dak. Agric. Exper. Sta., Soil Survey Circ. 1, 4 p., 1920.

A brief popular discussion of the fixation of atmospheric nitrogen by legume plants and the inoculation of legume crops.—J. M. S.

1291. Studies on the Longevity of B. radicicola in the Soil. W. A. ALBRECHT. Mo. Agric. Exper. Sta., Rpt. 1919–20, **54**.

The legume organism persists in soil for at least two years. Drying the soil in the sun does not appear to have an appreciable detrimental effect.—J. M. S.

1292. *Are Legume Bacteria Killed by Freezing?* E. B. Fred. Wis. Agric. Exper. Sta., Ann. Rpt. 1920, **36**.

Sweet clover seeds inoculated with nodule-forming organisms were subjected to freezing temperatures for 30 days. Plants grown from these seeds developed nodules.—J. M. S.

1293. *A Comparison of the Technic Recommended by the Various Authors for Quantitative Bacteriological Analysis of Soil.* Z. N. Wyant. Soil Sc., Balt., 1921, **11**, 295–303.

Comparative studies have been made in an effort to arrive at a standardization technic for the quanitative bacteriological soil analytical methods which would permit of a comparison of results in the hands of various workers. The points of difference in the technic used by the principal soil biology authorities are grouped under: (a) Amount of soil used; (b) proportion of soil to the diluting liquid in the first dilution; (c) the size of the second dilution; (d) the method of making the first dilution; (e) the technic for transplanting dilutions containing visible amounts of soil; (f) basis for the estimation of numbers (total or otherwise). The above points are classified in tables comprising the work of the principal authorities in this field.

The author's suggestions are summarized as follows: 1. Not less than 10 grams of soil should be used in making the first dilution. 2. The initial dilutions should not be less than 1–10. 3. If the soil contains considerable organic matter it should be triturated in a mortar with a little of the diluting liquid. 4. In all cases the weighed soil sample should be made up to the volume of the desired initial dilution by the addition of sufficient diluting liquid. i.e., for a 1–10 dilution, 10 grams of soil should be placed in the graduated flask, cylinder, etc., and sufficient diluting liquid added to bring the volumes up to 100 cc. 5. Care should be taken in making further dilutions in plating to transfer an aliquot of the soil itself as nearly as possible. 6. The second dilution should contain not less than one-tenth the amount of soil in the first dilution and further dilutions should be made by the same increments. 7. Numbers of microorganisms should be estimated on the basis of soil oven-dried at 100°C. to a constant weight. A good bibliography is appended.—N. K.

1294. *Some Biological Changes Brought about in Certain Delaware Soils by Different Cropping, Fertilizer, Liming, and Manurial Treatments.* T. F. Manns. Del. Agric. Exper. Sta., Ann. Rpt. 1919, 24–35.

A progress report on the second year of a continuing experiment covering 50 soils taken from different parts of the state. In general, liming increased the free nitrogen fixing organisms and the nitrifiers, and in some instances the Actinomyces. In one instance, however, (a Chester loam) the beneficial bacteria and the yield of clover were decreased by the application of lime. Applications of manure, in general, increased the ammonifiers, especially the subtilis group; in several cases, however, it is claimed that manuring brought about a detrimental flora.—J. M. S.

PLANT PATHOLOGY

1295. *Some Problems in Greenhouse Inspection Work in Indiana.* Harry F. Dietz. J. Econom. Entomol., 1921, **14**, 188–194.

A plea for a semi-annual inspection of greenhouses, once in summer and once in winter in order that greenhouse plants for intra- and inter-state shipment may be certified as to their freedom from insect and microbial disease, a list of which is given.—Z. N. W.

1296. *Heart Rot, Rib Rot, and Leaf Spot of Chinese Cabbages.* Nellie A. Brown and R. B. Harvey. Phytopath., Balt., 1920, **10**, 81–90.

The Chinese cabbage (*Brassica pekinensis* and *B. chinensis*) is subject to the black rot disease of the common cabbage produced by *Bacterium campestre*, and, as in the common cabbage, there may be also a rapid secondary infection by a soft rot organism. High temperature and excessive moisture favor the development of the disease. Control measures are suggested.—J. G. D. (*Contrib. by Bot. Abstr.*)

1297. *Is American Chestnut Developing Immunity to the Blight?* E. R. Hodson. J. Forestry, 1920, **18**, 693–700.

The chestnut blight does not appear controllable by ordinary methods but observations appear to show that immunity is developing or that individuals are resistant. As the chestnut sprouts at the base, the organism may live for two or three decades and in this period immunity, which is the only hope for forest stands, may actually develop. Two types of canker are recognized, atrophy, a depressed surface, and hypertrophy, a swollen distorted condition. In the first the plant makes no resistance to the disease, while in the second there is resistance to the invader. Immunity development requires time, of which the apparent recovery of living tissue after a long period of attack appears to be evidence. Long-time observations under forest conditions of actual developments are necessary to determine whether the hypothesis is substantiated.—E. N. (*Contrib. by Bot. Abstr.*)

1298. *Soil Sterilization.* C. T. Gimingham and G. T. Spinks. Ann. Rept. Agric. and Hort. Res. Sta. Univ. Brist., 1919, 37–42.

Soil infested with *Chrysophlyctis endobiotica*, the cause of potato wart, was placed in small pots and the following substances incorporated with it in the amounts indicated:

bleaching powder 1 gram, creosote 0.5 gram, chloro-picrin 0.3 gram, formalin 1 cc., powdered chalk 1.5 gr. (to neutrality) and 7.5 gr., "cymène" 0.25 gr. Steam-sterilized soil was used as a control. One week later a tuber was planted in each pot. At the same time other pots of the soil were planted and were moistened twice each week with the following solutions: copper sulfate 2 per cent, sulfur dioxid 0.1 saturated solution, formalin 1 per cent, bleaching powder 1 per cent. Aside from steam sterilization the only agents which reduced the amount of disease to any appreciable extent are copper sulfate, excess of chalk, and perhaps creosote. —Experiments in progress with disinfectants for the control of *Rhizoctonia* on carrots and spinach were discontinued because of the disappearance of the disease. Bleaching powder at the rate of 2 ounces per sq. yd. can be used safely for carrots. When 8 ounces are used severe injury results.—D. R. (*Contrib. by Bot. Abstr.*)

DAIRY BACTERIOLOGY

(*See also Number 1336*)

1299. Off-flavors in Butter. G. L. A. Ruehle. Mich. Agr. Exper. Sta., Quart. Bull., 1921, **3**, 103–104.

A summary of the results obtained at the Michigan Station upon the causes of off-flavors in butter. These results emphasize the necessity of maintaining the best possible dairy conditions if high class butter of good keeping quality is to be produced. Experimental work has shown that metallic salts (iron and copper salts of lactic acid) such as might be produced from rusty and worn utensils will produce metallic, tallowy, and fishy flavors in stored butter. Likewise the spore forming bacteria, such as *B. subtilis*, derived from dust and dirt were also found to produce metallic flavors. As neither rusty utensils nor dirty milk and cream occur where dairy conditions are maintained in first class condition, the author finds in these facts a strong argument for taking the best possible care of milk and cream intended for butter making.—R. S. B.

COMPARATIVE PATHOLOGY

(*See also Numbers 1315, 1316, 1326, 1434, 1464, 1482*)

1300. Sur la forme conidienne du Champignon agent de la lymphangite épizootique. (*Morphology of the Conidia of the Fungus, the Infectious Agent of Epizootic Lymphangitis.*) L. Matruchot and Brocq-Rousseu. Compt. rend. Soc. de biol., Par., 1921, **84**, 783–785.

The growth characteristics, under various conditions, of *Cryptococcus farciminosus* are described.—G. H. S.

1301. Pénétration du Trypanosome de la dourine à travers les muqueuses et les téguments. (*Penetration of the Trypanosome of Dourine through the Mucous Membranes and the Skin.*) L. Nattan-Larrier. Compt. rend. Soc. de biol., Par., 1921, **84**, 824–826.

Trypanosoma equiperdum is able to penetrate the membranes of the conjunctiva and the rectum, and the depilated skin, of the mouse. The mucosa of the upper digestive tract is apparently impenetrable.—G. H. S.

1302. Le diagnostic de la dourine. (*Diagnosis of Dourine.*) A. Broden and Ch. Van Goidsenhoven. Compt. rend. Soc. de biol., Par., 1921, **84**, 839–840.

Trypanosoma equiperdum can best be isolated from the blood by fractional centrifugation.—G. H. S.

1303. Variola humana und Maul- und Klauenseuche. (*Human Variola and Hoof and Mouth Disease.*) A. Groth. München. med. Wchnschr., 1920, **67**, 1497–1499.

Guided by certain clinical analogies in human smallpox and the hoof and mouth disease of cattle, some preliminary experiments have been made with the object of producing immunity by vaccinating animals against the latter disease. The results suggest the hope that such a procedure may ultimately prove successful.—B.C.

1304. La transfusion sanguine dans l'hyperimmunisation des bovidés contre la peste bovine (*Transfusion of Blood in the Hyperimmunization of Cattle against Rinderpest.*) René Sacreghem. Compt. rend. Soc. de biol., Par., 1921, **85**, 12–13.

Hyperimmunization is effected by direct transfusion of the animal to be treated with the blood of an infected animal. Animals treated in this way yield a potent antiserum.—G. H. S.

1305. Nécrose embolique du cerveau dans la nécrobacillose du veau. (*Embolic Necrosis of the Brain in Necrobacillosis of the Calf.*) M. Christiansen. Compt. rend. Soc. de biol., Par., 1921, **84**, 643–644.

Domestic animals infected with *B. necrosis* frequently develop embolic lesions, most frequently in the lung although they have been noted in the liver, spleen, kidney, mammary gland, myocardium, and the uterus. Similar lesions of the central nervous system are here reported.—G. H. S.

1306. Sur un nouvel Echinostome de l'intestin du porc. (*A New Echinostome in the Intestine of the Pig.*) I. Ciurea. Compt. rend. Soc. de biol., Par., 1921, **84**, 1010–1013.

A new parasite, *Euparyphium suinum*, is described. The infestation is ascribed to fish which formed part of the food of the pigs.—G. H. S.

1307. Présence de l'Ascaris suilla dans les fosses nasales d'un porcelet. (*Presence of Ascaris suilla in the Nasal Fossae of a Pig.*) I. Poenaru. Compt. rend. Soc. de biol., Par., 1921, **84**, 1026.

In addition to intestinal invasion, *Ascaris suilla* was found in the ethmoidal and maxillary sinuses.—G. H. S.

1308. Régression et phagocytose des fibres musculaires striées dans la tumeur infectieuse des oiseaux, chez les animaux résistants. (*Regression and Phagocytosis of the Striated Muscular Fibers in Infectious Tumors of Birds: in Resistant Animals.*) A. Peyron and C. Lieure. Compt. rend. Soc. de biol., Par., 1921, **84**, 656–659.

The paper deals chiefly with the histological findings which are recorded in detail and illustrated.—G. H. S.

PARASITIC DISEASES

(*See also Numbers 1301, 1302, 1306, 1307, 1330, 1331*)

1309. Notes on Treatment with Emetine at the University War Hospital, Southampton. Margaret W. Jepps. J. Roy. Army Med. Corps, Lond., 1921, **36**, 443.

One hundred and three men infected with *Entamoeba histolytica* received emetine treatment. Salol-coated pills of E. B. I. (emetine bismuthous iodide) proved unsatisfactory; 45 per cent of cases treated relapsed after a 12-day course of 36 grains. E. B. I. emulsion in liquid paraffin, 3 grains to ½ oz. of paraffin oil, taken by mouth with a little water, gave good results; a 12-day course of 36 grains, only 12 per cent of relapses occurred. The standard of cure consisted in almost daily examinations over a period of one month after completion of 12-day course. Subcutaneous injections of 1 gr. emetine hydrochloride proved useful in cases where because of vomiting E. B. I. treatment could not be tolerated. Patients on the E. B. I. treatment were not confined to bed, and were kept on a full semi-solid diet, with general improvement in the character of their stools and their physical condition from the onset.—W. P. B.

1310. Müssen wir unsere Anschauungen über die Aetiologie der Wurmfortsatzentzündung ändern? (*Must We Alter Our Views on the Etiology of Appendicitis?*) L. Aschoff. Berl. klin. Wchnschr., 1920, **57**, 1040–1046.

Is the primary factor of an appendicitis to be found in damage to the mucosa by intestinal worms, especially *Oxyuris?* Analysis of the facts indicates no sound support for such a view.—B. C.

1311. La schizotrypanosomiase américaine peut-elle être transmise par contagion génitale? (*Can American Schizotrypanosomiasis Be Transmitted by Genital Contagion?*) L. Nattan-Larrier. Compt. rend. Soc. de biol., Par., 1921, **84**, 773–775.

Infection of both husband and wife with *Schizotrypanum cruzi* is not uncommon. Such infections are most frequently due to the simultaneous, or independent, inoculation of the individuals by Conorhinus, but it is possible that the infection may be transmitted through the genital system. Experimentally it is shown that the vaginal membranes of the mouse are readily penetrated by the schizotrypanosome.—G. H. S.

1312. Sur la culture en milieu N. N. N. du Leptomonas pyrrhocoris. (*The Cultivation in the Medium N. N. N. of Leptomonas pyrrhocoris.*) G. Zotta. Compt. rend. Soc. de biol., Par., 1921, **84**, 822–824.

Report is made on the successful cultivation of *Leptomonas pyrrhocoris* in N. N. N. medium. The organisms are derived from infected *Pyrrhocoris apertus*. A description of the flagellates is given.—G. H. S.

1313. Recherche de la déviation du complément dans la distomatose humaine. (*Complement Deviation in Human Distomiasis.*) Louis Servantie. Compt. rend. Soc. de biol., Par., 1921, **84**, 699–700.

Specific fixation of complement was secured.—G. H. S.

1314. L'échinococcose encéphalique expérimentale envisagée comme type de tumeur intra-crânienne expérimentale. (*Experimental Intracerebral Echinococcus Infection Seen as a Type of Experimental Intracranial Tumor.*) F. Dévé. Compt. rend. Soc. de biol., Par., 1921, **84**, 711–713.

The intracerebral inoculation of rabbits with small amounts of echinococcus fluid led to the development of typical intracranial polycystic tumors.—G. H. S.

1315. Un Schizotrypanum chez les chauves-souris (Vesperugo pipistrellus) en Basse-Alsace. Schizotrypanose et goître endémique. (*A Schizotrypanosome in the Bat (Vesperugo pipistrellus) in Lower Alsace. Schizotrypanosomiasis and Endemic Goitre.*) EDOUARD CHATTON AND ROBERT COURRIER. Compt. rend. Soc. de biol., Par., 1921, **84**, 943–946.

The organism, which is described in detail, was isolated from a bat (*Vesperugo pipistrellus*). The specific affinity of a related form, *Schizotrypanum cruzi*, for the thyroid gland, and the probable wide distribution of other organisms of this same character, suggests the idea that endemic goitre may be associated with some such organism.—G. H. S.

1316. Microfilaire sanguine du boeuf a la Guyane Française. (*Microfilaria in the Blood of Cattle in French Guiana.*) MARCEL LEGER. Compt. rend. Soc. de biol., Par., 1921, **84**, 419–420.

The parasite is described in detail and is tentatively named *Microfilaria guyanensis*. It was found in but one of 300 animals examined.—G. H. S.

TROPICAL DISEASES

1317. II. Oral Administration of Quinine Sulphate Grains 20 to Adult Natives Infected with Malignant Tertian Malaria. J. W. S. MACFIE. Ann. Trop. M. & Parasitol., Liverp., 1920, **14**, 93.

The quinine was administered in solution. In all cases the parasites disappeared from the cutaneous blood in 1 to 2 days.—W. C. B.

1318. III. Oral Administration of Quinine Sulphate Grains 10 Daily for two Consecutive Days only to Native School-boys Infected with Malignant Tertian Malaria. J. W. S. MACFIE. Ann. Trop. M. & Parasitol., Liverp., 1920, **14**, 95.

Sixty-two native school-boys received treatment. The parasites disappeared from the cutaneous blood in one or two days, but parasitic relapses occurred in the majority of cases. In only one case was there definitely known to have been a febrile relapse. The boys range in age from 5 to 18 years.—W. C. B.

1319. IV. Oral Administration of Quinine Sulphate to Natives Infected with Quartan and Simple Tertian Malaria. J. W. S. MACFIE. Ann. Trop. M. & Parasitol., Liverp., 1920, **14**, 111.

The quinine was given orally in solution. Fifteen cases of quartan malaria were treated as follows: 3 cases received 10 grains on 2, 2, and 9 consecutive days respectively, 1 received 10 grains in one day only; and the remaining 11 received 10 grains for 2 consecutive days. The age of the patients varied from 6 months to 18 years and included one man of 65 years. The parasites disappeared from the cutaneous blood either on the same day that the treatment was begun or in one or two days. There were no febrile attacks during the treatment of any of the cases. Six cases had a parasitic relapse.

Five cases of simple tertian malaria were treated as follows: 3 cases received 10 grains of quinine sulphate on 2 consecutive days and to the other 2 cases 20 grains were given for 2 and 3 consecutive days respectively. The ages ranged from 1 to 35 years. The parasites did not disappear from the cutaneous blood of one of the patients, a child. Another case had a parasitic relapse; but no febrile relapses took place in any of the cases within the observational period of 60 days. The author states that "the percentage of relapses in natives other than young children treated in the tropics is decidedly less than in Europeans treated in England."—W. C. B.

1320. Bäder und Chinin bei chronischer Malaria. (*Baths and Quinine in Chronic Malaria.*) R. LURZ. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1420

Cool and cold baths affect the blood circulation in such a manner that malarial parasites are mechanically drawn into the sphere of influence of administered quinine.—B. C.

1321. Le liquide céphalorachidien dans la fièvre récurrente. (*The Cerebrospinal Fluid in Recurrent Fever.* J.-J. NITZESCU. Compt. rend. Soc. de biol., Par., 1921, **84**, 1037–1038.

During a large epidemic of recurrent fever examinations were made of the cerebrospinal fluid. *Spirocheta obermeieri* was not observed in any instance, but of 6 instances in which the fluid was injected into individuals 4 developed typical attacks. It is concluded that the spirochetes enter the fluid but in small numbers.—G. H. S.

1322. Le pétrole dans la traitement de la fièvre récurrente et de la trypanosomiase. (*Petrole in the Treatment of Recurrent Fever and Trypansomiasis.*) RENÉ SACEGHEM. Compt. rend. Soc. de biol. Par., 1921, **85**, 11–12.

In many localities petrole is administered *per os* for the treatment of recurrent fever. Experimental work indicates that the substance, given either by mouth or by intravenous injection, favors rather than diminishes the development of trypanosomes.—G. H. S.

MEDICAL ENTOMOLOGY

1323. Ueber die Fortschritte der praktischen Kriebelmückenforschung und die wasserhygienischen Gesichtspunkte der Brutbekämpfung. (Progress in Practical Studies on Simulium Flies and Considerations of Water Hygiene in Combatting the Immature Stages.) J. WILHELMI. Hyg. Rundschau, Berl., 1921, 129–168.

Supplementing his comprehensive review of the work on the Simulium flies (see Abs. Bact., 1921, No. 575) Dr. Wilhelmi reviews the literature of 1920 and also gives a preliminary report of the detailed investigations in this field under way at the "Landesanstalt für Wasserhygiene," at Berlin.—W. A. R.

1324. The First Instar of Wohlfahrtia vigil Walker. O. A. JOHANNSEN. J. Parasitol., Urbana, Ill., 1921, **7**, 154–155.

Wohlfahrtia vigil is a sarcophagid fly whose larva has been repeatedly reported as a human parasite. The species is larviparous. The hitherto undescribed first stage larva is more distinctly spinose than the second and third stages but is less spinose than the European *W. magnifica* described and figured by Portchinsky, 1884.—W. A. R.

PROTOZOÖLOGY

1325. Lankesteria planariae, Grégarine, parasite des Planaries d'eau douce. (Lankesteria planariae, a Gregarine, Parasitic upon the Planaria of Soft Water.) A. VANDEL. Compt. rend. Soc. de biol., Par., 1921, **84**, 718–719.

The Gregarine, *Lankesteria planariae*, was found parasitic in *Pl. lugubris* and *Pl. polychroa*. The parasites do not seem to injure the host.—G. H. S.

ANIMAL PARASITES

1326. An Annotated List of the Animal Parasites of Foxes. W. A. RILEY. Parasitology, Cambridge, 1921, **13**, 86–96.

In view of the rapid growth of the new industry of raising black and silver foxes for their fur a consideration of fox parasites has an important economic aspect.

From personal studies and review of the literature 74 species of animal parasites of foxes are listed, together with data on synonomy.—W. A. R.

1327. Crossocephalus zebrae, n. sp. W. YORKE AND T. SOUTHWELL. Ann. Trop. M. & Parasitol., Liverp., 1920, **14**, 127.

A new viviparous nematode is described by the authors. It was found in collections taken from the intestine of 6 zebrae (*Equus burchelli*). The worm is somewhat similar to *Crossocephalus viviparous* except that the vulva in the latter is located a short distance behind the middle of the body while in the former it occurs immediately in front of the anus. Another closely allied species was found by Baylis (1919) in the rhinoceros and named by him *Crossocephalus longicaudatus*.—W. C. B.

1328. On two New Tapeworms from the Ostrich, with a Key to the Species of Davainea. Parasitology, Cambridge, 1921, **13**, 1–24.

Tapeworms collected from ostriches in British East Africa proved to be two new species of *Davainea*. Of these one was so fragmentary that specific description was inadvisable, the other is described under the name *D. beddardi*.

The paper includes a valuable key to above 90 of the 106 known species of *Davainea*, the omissions being on account of imperfect descriptions. A host index shows the adult worms to be distributed among 120 different species of which 16 are mammals and the remainder birds.—W. A. R.

1329. Anguillulose intestinale des singes a la Guyane Française. (Intestinal Worms of Monkeys in French Guiana.) MARCEL LEGER. Compt. rend. Soc. de biol. Par., 1921, **84**, 555–558.

Strongyloides stercoralis was found as an intestinal parasite in 3 of 10 monkeys.—G. H. S.

EPIDEMIOLOGY

(See Numbers 1237, 1367, 1416)

CARRIERS OF INFECTION

(See Number 1489)

DISINFECTION AND GROWTH INHIBITION

1330. An Address on Disinfection and Disinfestation in the Field. I. W. W. O. BEVERIDGE. Pub. Health, Lond., 1921, **34**, 59–63.

"At least 50 per cent of the total sick admissions among troops in the field can primarily be attributed to lack of personal cleanliness and to the presence of vermin." Brigadier-General Beveridge offered a scheme for the elimination of vermin in the army to reduce the dangers of tetanus, anthrax, and gas gangrene infection from manured soil, through breaks in the skin made by vermin. The following outlines his plan:

A. Cleansing Unit.

1. Movable laundries to work in advance of rail heads.

2. Mobile baths and disinfectors. (a) Disinfectors to destroy pathogenic bacteria including spores. (b) Disinfectors for body vermin only.

Mobile (horse drawn and railway coaches) and stationary steam disinfectors were used on the march and in hospitals respectively. Sulphur dioxide as a disinfectant was found efficient. General description of various mechanical arrangements and output (5000 pieces per hour).

The German system of disinfection was similar to the English with the exception of the use of hot air in place of steam. In France, chemicals played a great part in the struggle against vermin. Cresol, formaldehyde and chlorine of lime were mainly in use.—J. B.

1331. An Address on Disinfection and Disinfestation in the Field. II. W. W. O. Beveridge. Pub. Health, Lond., 1921, **34**, 85–87.

Deals more in detail with the disinfection of clothing by hot air disinfection, which being less costly than steam is advised if the proper circulation of the hot air can be secured, for the following reasons: Greater ease and lessened cost of the construction of the apparatus; greater range of usable fuel; absence of shrinkage, etc., in clothing; equal applicability to any type of material (leather, rubber, wool, etc.) and the greater rapidity at which disinfection can be accomplished.

While simple forms of hot air disinfectors, such as the Russian Pit disinfectors are shown to be usable, the Orr hot air disinfector (described in detail was adopted for disinfection in demobilization processes which are given in some detail.—J. B.

1332. Ueber die oligodynamische Fernwirkung des Sublimats. (*The Oligodynamic Effect at a Distance of Sublimate.*) Oskar Weltmann. Wien. klin. Wchnschr., 1920, **33**, 1068–1070.

The phenomenon is explicable by the observation that actual transfer of the germicide takes place by means of sublimation. No unequivocal evidence has yet been presented to show the operation of a hitherto unknown force.—B. C.

1333. Untersuchungen über den Einfluss oligodynamischer Metallwirkungen auf das Wachstum von Bakterien. (*Studies on the Influence of Oligodynamic Effects of Metals upon Bacterial Growth.*) Walter Seiffert. München. med. Wchnschr., 1920, **67**, 1437–1438.

Under suitable conditions a culture of *Bact. coli* growing on an Endo plate in which had been placed a silver coin will show: (1) a sharply defined sterile zone surrounding the coin, (2) a zone of sparse growth, (3) a zone of accelerated growth, and (4) surrounding these the normal growth of the plate. The author confirms the findings of others in this regard and shows it to be a general phenomenon proving the validity of Arndt's law.—B. C.

1334. Bestehen gerechtfertigte Bedenken gegen die Verwendung von Blausäure und blausäurehaltigen Mitteln (Zyklon) als Vernichtungsmittel für Ungeziefer im grossen (Entwesung). (*Are there Justifiable Objections to the Use of HCN or its Compounds in Large Scale Fumigations.*) K. B. Lehmann. München. med. Wchnschr., 1920, **67**, 1517–1520.

Fatal accidents caused by hydrocyanic acid in fumigation are mainly due to carelessness. Organic compounds of cyanogen have the advantage of possessing lachrymatory properties which render absolutely uninhabitable the places that are being fumigated.—B. C.

FOOD BACTERIOLOGY

(*See also Number 1283*)

1335. Further Work on the Bacteriology of Swelled Canned Sardines. W. Sadler, Irene Mounce and Eleanor Shanly. Trans. Roy. Soc. Can., Ottawa, 1919, **13**, Ser. III, 135–141.

In the "Contributions to the Biological Board of Canada," an Interim Report on the Bacteriology of Swelled Canned Sardines was published by the senior worker in 1918. That report recorded the isolation and detailed studies of 8 strains of gas-producing bacteria; 2 strains were classified as *B. vulgaris* (Hauser 1885), and the remaining 6 strains as typical and atypical types of the colon-aerogenes group. The present paper is concerned with that phase of the investigation which deals with the inquiry into the possible sources of the causative bacteria. The material examined included the intestines of freshly caught herrings, water from the inside of various weirs, mud from weirs at low tide, water at low tide as used for pickle in the canneries, sea water as run into the canneries, sea water dipped out of pickle tank after herrings had been put in. From the various sources enumerated herein, gas-producing bacteria have been secured. The bacteria isolated have been classified as follows: cultures 1, 5 and 22 as types of *B. vulgaris* (Hauser 1885); culture 2 as of the type *B. acidilactici* (Hueppe); cultures 9 and 15 as of the type *B. aerogenes* (Escherich); culture 17 as of the type *B. coli* (Escherich); culture 18 as of the type *B. communior*; cultures 8 and 24 as of the Para-Gaertner group (Savage). Using cultures 5, 17 and 18 respectively, experimental swelled cans of sardines have been produced, and the "Postulates of Koch" have been satisfied.—W. S.

1336. Ueber die "schädliche" Wirkung zersetzter Milch. (The "Harmful" Effect of Soured Milk.) Hans Perger. München. med. Wchnschr., 1920, **67**, 1467–1468.

Experiments were performed upon dogs with duodenal fistulas with the object of determining the effect of HCl, lactic and acetic acids and soured milk upon gastric and duodenal digestive rates. Lactic acid and HCl affected the rates in essentially the same manner. This observation is held to support the view of Rietschel that spontaneously soured milk is harmless as a food, and that it has even a certain therapeutic value.—B. C.

HEALTH BOARD LABORATORY METHOD

1337. Sur l'homogéneisation des crachats tuberculeux et la recherche du Bacille de Koch dans le pus d'abcès froids et d'adénites suppurées et dans les urines. (The Homogenization of Tuberculous Sputum and the Demonstration of the Bacillus of Koch in the Pus of Cold Abscesses and in Suppurating Adenitis and in the Urine.) Ernest Renaux. Compt. rend. Soc. de biol., Par., 1921, **84**, 833–834.

Sputum, or other material containing much organic matter along with *B. tuberculosis*, is autoclaved for 2 to 3 minutes at 120°. After centrifugation the sediment is treated with 10 to 20 times its volume of 0.5 per cent or $\frac{N}{10}$ sodium hydrate. By boiling, with shaking, for 5 to 10 minutes the entire material is rendered fluid. The solution is centrifuged while hot and the sediment is used for smear preparations.—G. H. S.

1338. Sur un nouveau procédé de concentration du Bacille de Koch dans les crachats. (A New Technic for the Concentration of the Bacillus of Koch in the Sputum.) J.-B.-R. Faisca. Compt. rend. Soc. de biol., Par., 1921, **84**, 1002–1003.

Several particles of sputum are placed upon a slide and a few drops of 15 per cent antiformin are added. With slight heating the material goes into solution. It is then dried upon the slide, fixed, and stained.—G. H. S.

1339. Zur Auswurfuntersuchung. (Sputum Examination.) Warnecke. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1439–1440.

Sputum is hardened and fixed directly in Müller's or Zenker's solution at 37°C. The material is then imbedded in paraffin, sections cut and the latter examined after suitable staining.—B. C.

1340. Beobachtungen über die Gruber-Widalsche Reaktion bei Typhusschutzgeimpften. (Observations on the Gruber-Widal Reaction in the Protectively Vaccinated.) Max Roth. Berl. klin. Wchnschr., 1920, **57**, 1046–1048.

Even 2 years after anti-typhoid vaccination there may be present a relatively high agglutination titer, so that its discovery is no definite sign of typhoid infection. It must also be remembered that injected proteins may cause a rise in the titer.—B. C.

DIATHETIC AND DEFICIENCY DISEASE

(See also Number 1423)

1341. Etiology of 150 Cases of Bronchial Asthma. George Piness. Calif. State J. M., San Fran., 1921, **19**, 29.

A general account of the author's work in determining the etiological factors in 150 cases. Asthmatic individuals giving a history of onset of the asthma after the age of 35 years usually give reactions to bacterial proteins.—J. R. S.

1342. Les états scorbutiques passagers et récidivants. (Transitory and Recurrent Scorbutic States.) G. Mouriquand and P. Michel. Compt. rend. Soc. de biol., Par., 1921, **84**, 734–735.

Report is made of experiments in guinea pigs showing the effect of antiscorbutic substances. G. H. S.

1343. Scorbut expérimentale et inanition. (Experimental Scurvy and Inanition.) G. Mouriquand and P. Michel. Compt. rend. Soc. de biol., Par., 1921, **84**, 735–737.

Guinea pig experiments indicate that scurvy and inanition are distinct processes and are unrelated.—G. H. S.

CANCER RESEARCH

1344. Beitrag zur Kenntnis der teleangiektatischen Granulome. (Telangiectatic Granuloma.) Luchs. München. med. Wchnschr., 1920, **67**, 1470–1471.

A case is described and the literature on this uncommon human affection reviewed. Its relation to animal botryomycosis is questioned. The disease is of unknown etiology, but the symptoms suggest an infectious toxic cause.—B. C.

1345. Sur l'étiologie de la lymphogranulomatose inguinale subaiguë à foyers purulents intra-ganglionnaires. (*The Etiology of Subacute Inguinal Granulomatosis with Purulent Foci within the Glands.*) H. DARRÉ AND J. DUMAS. Compt. rend. Soc. de biol., Par., 1921, **84**, 923–925.

Cultures from pus derived from cases of lymphogranulomatosis were uniformly sterile; and subcutaneous injections into mice, subcutaneous and intratesticular injections into rabbits and guinea pigs, and intratesticular and intraglandular injections into monkeys have been without result. Intraocular injection of rabbits has given constant results; the production of an iritis.—G. H. S.

1346. Zur Lymphogranulom-Frage. (*The Lymphogranuloma Problem.*) FR. HENKE. Berl. klin. Wchnschr., 1920, **57**, 1113–1114.

Lymphogranulomatosis is considered a specific infectious disease, the causative parasitic organism of which has not yet been discovered.—B. C.

DISEASES OF THE BLOOD, LYMPHATICS AND DUCTLESS GLANDS

(*See also Number 1241*)

1347. Les organes a sécrétion interne dans les infections a microbes anaérobies. (*The Endocrine Glands in Infections with Anaerobic Bacteria.*) P. VAN GEHUCHTEN. Compt. rend. Soc. de biol., Par., 1921, **84**, 459–461.

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The adrenal, hypophysis, and thyroid tissues of 65 guinea pigs dying of anaerobic infections were studied. The thyroid showed only a moderate degree of congestion with but little evidence of hypersecretion. The hypophysis also, was only slightly congested. In an occasional animal it showed a slight leucocytic infiltration, and in many instances there appeared to be a diminution of eosinophils. In certain mixed infections, as *B. proteus* and an anaerobe, the adrenal showed hemorrhagic areas but the vascular damage could hardly account for any adrenal insufficiency. The relation of cholesterol content and adrenalin secretion may be an important factor in the infection and in the neutralization of toxins. —G. H. S.

DISEASES OF THE CIRCULATORY SYSTEM

1348. Untersuchungen zur Therapie der perniziösen Anämie. (*Studies on the Therapy of Pernicious Anemia.*) LEO HOLLAENDER. Berl. klin. Wchnschr., 1920, **57**, 997–998.

Arsenic and colloidal silver seemed effective in the two cases described. This may give a hint as to the pathogenesis of the disease.—B. C.

1349. Zur Einteilung der Endocarditiden. (*The Classification of Endocardites.*) H. BEITZKE. Berl. klin. Wchnschr., 1920, **57**, 1233–1234.

The acute endocardites may be classified as follows:

I. Endocarditis benigna sive simplex sive verrucosa.

II. Endocarditis maligna sive septica sive mycotica. (a) polyposa, (b) ulcerosa, (c) ulcerosa et polyposa—B. C.

DISEASES OF THE DIGESTIVE SYSTEM

(*See also Numbers 1240, 1255, 1257, 1267, 1310, 1340, 1452, 1477, 1488, 1489*)

1350. Zur Bakteriologie der Ruhrerkrankungen des Jahres 1920 in Wien. (*Bacteriology of Dysenteric Infections in Vienna in 1920.*) L. KIRSCHNER AND I. SEGALL. Wien. klin. Wchnschr., 1920, **33**, 1125–1126.

Bedside culture of dysenteric stools increases the percentage of positive findings. Best results are secured by removal of suspected material by aid of direct rectoscopy from the diseased mucosa. In addition to the Kruse-Shiga, Flexner, Y and Strong types, the Schmitz type was also found in the 1920 epidemic. An organism with the characteristics of *Bact. fecalis alkaligenes* was isolated in pure culture from some cases of dysentery; but it is not known if it has an etiologic relation to the disease.—B. C.

1351. Zur Ruhrepidemie in Thüringen. (*The Dysentery Epidemic in Thuringia.*) EUGEN JENNICKE. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1308–1309.

A dysentery epidemic was started by a returned prisoner from France. The organism recovered at autopsy was of the Shiga-Kruse type. Of the 108 persons infected, 19 died. —B. C.

1352. Ein Fall von Encephalitis hemorrhagica bei Dysenterie. (*A Case of Hemorrhagic Encephalitis in Dysentery.*) S. BUTTENWEISER. München. med. Wchnschr., 1920, **67**, 1472.

This uncommon complication was confirmed in the necropsy of the case described. It is believed, however, that the encephalitic symptoms were due to dysentery toxin and not to the cause of post-influenzal encephalitis.—B. C.

1353. Bacillus fecalis alcaligenes isolé du sang d'un individu atteint d'une maladie a allure typhoïde. (Bacillus fecalis alkaligenes Isolated from the Blood of an Individual with a Typhoid-like Disease.) A. DE MAGALHAES. Compt. rend. Soc. de biol., Par., 1921, **84**, 591–592.

B. fecalis alkaligenes was secured in blood culture from a case presenting the clinical features of typhoid fever. The patient's serum failed to agglutinate other members of the enteric group but with the organism isolated agglutination took place in dilutions as high as 1:400.—G. H. S.

1354. Pfortadersklerose als Folgeerscheinung von Appendizitis. (Portal Vein Sclerosis as Sequel to Appendicitis.) E. GOHRBANDT. Berl. klin. Wchnschr., 1920, **57**, 977–979.

A case is described in detail. Appendicitis may give rise to a local inflammation of the portal vein and surrounding connective tissue which heals spontaneously. This may lead to results commonly seen following cirrhosis of the liver due to compression of the interhepatic branches of the portal vein.—B. C.

DISEASES OF THE GENITO-URINARY SYSTEM

(See also Numbers 1248, 1311, 1403, 1405, 1415, 1421, 1422, 1446, 1447, 1450, 1451, 1453, 1475, 1476)

1355. Geschlechtlich übertragbare orinigäre Kaninchensyphilis und Chinin-Spirochätotropie. (Specific Venereal Rabbit Syphilis and Quinine Spirochetotropism.) J. SCHERESCHEWSKY. Berl. klin. Wchnschr., 1920, **57**, 1142–1144.

There is an infection among rabbits known not to be experimentally inoculated, that is almost indistinguishable from that produced by *Spirocheta pallida*. The disease is very readily transferred among rabbits during coitus, the incubation period being about 14 days. The causative spirochete possesses all the known characters of *pallida* from human lesions. However, previous infection in rabbits with organisms from either host does not prevent a subsequent infection with organisms from the other. Furthermore, the rabbit infection is not transmissible to apes. This primary syphilis of rabbits has a great advantage over the experimental infection in the study of syphilology.

Prophylactic application of quinine salve was found effective in preventing natural infection among rabbits.—B. C.

1356. Ueber Spirochätenbefunde in Lymphdrüsen. (Findings of Spirochetes in Lymph Glands.) RICHARD FRÜHWALD. Wien. klin. Wchnschr., 1920, **33**, 1000–1003.

Details are given of 89 gland punctures in 83 cases of syphilis comprising all stages of the disease. The glands may conceal the spirochetes as long as 3 years. An extensive bibliography is included.—B. C.

1357. Primäraffekte der behaarten Kopfhaut und ihr Infektionsmodus. (Primary Diseases of the Scalp and their Mode of Infection.) W. FISCHER. Berl. klin. Wchnschr., 1920, **57**, 1220–1221.

Primary syphilitic infections of the scalp may be brought about in numerous ways, including apparently dried infectious material.—B. C.

1358. Zur Wirkung reiner Silbersalvarsankuren bei frischer Syphilis und syphilitischer Nephrose. (The Effect of Exclusive Silversalvarsan Treatment on Syphilis and Syphilitic Nephroses.) E. ZURHELLE. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1354–1356.

Mercury is recommended as an adjunct in the treatment of primary syphilis and especially of secondary syphilis.—B. C.

1359. Ein Beitrag zur Kenntnis Familiensyphilis. (Familial Syphilis.) ERHARD RIECKE AND ELIZABETH HOERNICKE. München. med. Wchnschr., 1921, **68**, 1–4.

An endemic spread of syphilis was found in 6 families involving 32 persons coming from rural communities. Most of the infections were of non-venereal origin, a fact which indicates the great need for teaching the fundamentals of cleanliness to the peasantry.—B. C.

1360. Syphilis und Schwangerschaft. (Syphilis and Pregnancy.) ALFRED LOESSER. Berl. klin. Wchnschr., 1920, **57**, 1001–1003.

Among a million children born each year in Germany, 39,113 are congenitally syphilitic. This conclusion is based on figures obtained from representative localities.—B. C.

1361. Some Observations From the Clinical and Laboratory Findings in Pyelitis and Pyelonephritis. LEON J. ROTH. Calif. State J. M., San Fran., 1921, **19**, 16.

There was no distinctive relationship between the degree of the bacilluria and the leucocyte count found in these cases. Vaccine treatment was found valueless. In the series were several cases of colon bacilluria, one case of pure staphyococcus bacilluria, and one case of pure gonococcus bacilluria. The presence of blood and renal casts is also discussed.—J. R. S.

DISEASES OF THE LOCOMOTOR SYSTEM

1362. A Group Study of 300 Cases of Arthritis. M. C. Harding. Calif. State J. M., San Fran., 1921, **19**, 26.

In 89 per cent of the arthritis cases at Camp Lewis revealed as etiological factors, infectious processes other than those in the joints themselves. These etiological findings were as follows:

Cases in which more than one infectious process was found	57
Tonsils	51
Teeth	31
Prostate	12
Gonorrhea present	9
Positive Wassermann	4
Sinus infection	5
Pyorrhea	3.5
Tuberculosis of the lungs	2.0

All blood cultures were negative. The cleaning up of the dental conditions gave a more prompt relief than tonsillectomy. Typical gonorrheal arthritis was rare. Treatment based upon the etiology of the focal infection gave the best results.—J. R. S.

1363. Unsere Erfahrungen mit Sanarthrit Heilner bei der chronischen Gelenkaffektionen. (Results with Heilner's Sanarthrit in Chronic Arthropathies.) Heinrich Schäfer. Berl. klin. Wchnschr., 1920, **57**, 1170–1171.

In 12 cases treated with sanarthrit (a cartilage extract), 2 were much improved and 7 were relieved of pain. Undesirable reaction occurred in one.—B. C.

DISEASES OF THE NERVOUS SYSTEM

(See also Numbers 1321, 1352, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1437, 1446, 1447)

1364. Epidemic Encephalitis (Encephalitis lethargica nona). Report of Studies Conducted in the United States. H. F. Smith. Pub. Health Rep., Wash., 1921, **36**, 207–242.

This paper reports the results of an epidemiological study of encephalitis lethargica occurring in the United States. Data were obtained from state and city health officials, from physicians and the patients themselves. An analysis of these data furnishes information in regard to age and sex distribution, mortality rate, relation to incidence of influenza and poliomyelitis, mode of onset and symptomatology. The conclusion is reached that the disease is a clinical entity differing from any other disease. The length of the incubation period is uncertain. The age distribution is entirely different from that of poliomyelitis, indicating that the disease is separate and distinct from the latter. Most of the epidemics reported have been preceded by epidemic outbreaks of influenza, but the apparent relation between the two diseases remains unsolved. Unsuccessful attempts to transmit the disease to monkeys with glycerinated virus are described. A review of the more important literature is included. —I. A. B.

1365. Démonstration de l'activité du virus de l'encéphalite dans les centres nerveux 15 mois après le debut. Présence de ce virus dans les glandes salivaires. (Demonstration of the Activity of the Virus of Encephalitis in the Nervous Centers 15 Months after Onset. Presence of this Virus in the Salivary Glands.) A. Netter, E. Cesari and H. Durand. Compt. rend. Soc. de biol., Par., 1921, **84**, 854–855.

Experimental inoculation of a rabbit was possible with the nervous tissue of a man who died of lethargic encephalitis 15 months after the onset of the disease. The virus can be transferred from one animal to another by the inoculation of an extract of the salivary glands. The virus remains virulent in 50 per cent glycerol for at least 32 days.—G. H. S.

1366. Études expérimentales sur l'encéphalite épidémique. (Experimental Studies upon Epidemic Encephalitis.) Leo Loewe and Israel Strauss. Compt. rend. Soc. de biol., Par., 1921, **85**, 7–9.

Convalescent serum is able to neutralize the virus of lethagic encephalitis *in vitro;* normal serum fails to effect neutralization. Subdural inoculation of monkeys confers an immunity to subsequent inoculations. Complement fixation and agglutination reactions in encephalitis have been negative, but when the organisms are suspended in convalescent serum the Pfaundler reaction takes place. The production of encephalitis in sheep is reported.—G. H. S.

1367. Epidémiologie de l'encéphalite léthargique. (Epidemiology of Encephalitis Lethargica. Carl Kling and Folka Liljenquist. Compt. rend. Soc. de biol., Par., 1921, **84**, 521–524.

From an intensive study of the epidemiology of encephalitis lethargica the following conclusions are drawn: In an epidemic of encephalitis lethargica the number of frank cases is greatly exceeded by the number of mild and usually unrecognized cases. In different communities the morbidity varies between 7 and 45 per cent. In many families all members are attacked simultaneously, and in some houses every occupant becomes infected. The initial symptoms are common to the mild and the severe cases, but only in the latter are the nervous symptoms manifested. The mild cases are of prime importance in the dissemination of the disease. There is no evidence that encephalitis is transmitted by water, milk, or by such insects as bed-bugs, fleas or lice. Domestic animals—dogs and cats—do not seem to be implicated. Human contact, and in particular the ambulatory cases, seems to be the mode of distribution, the virus being spread by means of the nasopharyngeal secretions and the intestinal contents. The incubation period is about 10 days. The disease spreads throughout a district very rapidly.—G. H. S.

1368. Etiologie et épidémiologie de l'encéphalite léthargique. (*Etiology and Epidemiology of Encephalitis Lethargica.*) C. Kling, H. Davide and F. Liljenquist. Compt. rend. Soc. de biol., Par., 1921, **84**, 815–816.

Study of many cases of lethargic encephalitis warrants the following conclusions:

The nervous tissue derived from a case of encephalitis lethagica is sterile. Intracerebral inoculation of rabbits with nervous tissue, with the nasopharyngeal secretions, and with fecal material from cases of encephalitis has caused infection. Similar injections into monkeys have failed to infect them. The incubation period in the rabbit may be short, 2 to 10 days or it may be much longer, 40 to 50 days. In one instance a rabbit died 7 months after inoculation. The rabbit manifests the same symptoms as are present in the infected man; rise in temperature, ataxia, etc., and the pathological anatomy of the lesions is identical. Transmission of the infection from rabbit to rabbit is possible; 5 passages have been recorded. The invisible virus will pass through a Berkefeld filter, and it can be preserved in glycerol for at least 23 days. It can not be cultivated by any means tried thus far. The virus has been demonstrated in the nasopharyngeal secretions on the 19th day of the diesase, and in fecal material it will remain viable for at least 5 days.

In a note to this paper Levaditi points out that these results confirm those reported by Levaditi and Harvier.—G. H. S.

1369. Zur Klinik der Encephalitis epidemica, unter besonderer Berücksichtigung der Prognose und des Blutbildes. (*The Clinic of Epidemic Encephalitis with Special Regard to the Prognosis and the Blood Picture.*) A. Géronne. Berl. klin. Wchnschr., 1920, **57**, 1160–1164.

During the disease there is a marked lymphocytosis which is of some prognostic value. —B. C.

1370. Ueber die Anatomie der Encephalitis epidemica. (*The Anatomy of Epidemic Encephalitis.*) Gotthold Herxheimer. Berl. klin. Wchnschr., 1920, **57**, 1164–1166.

From strict anatomical considerations, the disease should be called poliomyelo-encephalitis.—B. C.

1371. Méningite à diplocoque de Jaeger-Heubner. (*Meningitis Due to the Diplococcus of Jaeger-Heubner.*) Pierre Gelasesco and S. Iacnov. Compt. rend. Soc. debiol., Par., 1921, **84**, 1013–1014.

A case of meningitis due to the diplococcus of Jaeger-Heubner is recorded. The clinical findings are detailed and the organism is described. The cocci were very abundant in the spinal fluid, occurring both intra- and extra-cellularly. The organism grew upon serum or ascitic agar with minute grayish colonies, after an incubation period of 72 hours. Levulose, galactose, lactose and saccharose were fermented. The organism was not agglutinated by antimeningococcic serum in dilutions higher than 1:50, but the serum of the patient reacted with it in a dilution of 1:200. There was but one isolated case; the first reported in Roumania. —G. H. S.

DISEASES OF THE RESPIRATORY SYSTEM (EXCEPT INFLUENZA AND TUBERCULOSIS)

(*See also Numbers 1413, 1462, 1478*)

1372. Un nouveau cas de Pasteurella chez l'homme. (*A New Case of Pasteurella Infection in Man.* Ed. Ortscheit. Compt. rend. Soc. de biol., Par., 1921, **84**, 941–942.

The organism described was found in the purulent material derived from an empyema. The bacilli were highly pleomorphic, non-motile, non-liquefying, Gram-negative. Large umbilicated colonies developed on agar containing ascitic fluid, and the medium gave a pronounced odor of rancid butter. Indol production was delayed, milk was not coagulated, nor was hemoglobin affected. It was a facultative anaerobe and was not dissolved by bile. It was pathogenic for guinea pigs and rabbits. The serum of the patient agglutinated the organism in dilutions as high as 1:3000.—G. H. S.

1373. Recherches bactérioligiques sur la broncho-pneumonia du viellard. (*Bacteriological Researches upon the Broncho-Pneumonia of the Aged.*) G. Roussy and Ed. Peyre. Compt. rend. Soc. de biol., Par., 1921, **84**, 625–626.

Examination of sputum in 50 cases showed that the pneumonia was frequently associated with infection with such forms as *B. Friedländer*, *M. catarrhalis*, staphylococci, and *M. tetragenus*. In 13 cases a pneumococcus was found (fixed types) and in 25 cases an organism of undetermined and indefinite nature (simply classified as being of the pneumococcus-streptococcus-enterococcus group) was present. In 3 cases streptococci were found and in one instance *Bact. diphtheriae*.—G. H. S.

1374. *Recherches expérimentales sur la broncho-pneumonie.* (*Experimental Research upon Broncho-Pneumonia.*) GUSTAVE ROUSSY AND ROGER LEROUX. Compt. rend. Soc. de biol., Par., 1921, **84**, 780–781.

Infarcts and obliterative vascular changes are characteristic of broncho-pneumonia in the aged. The infectious process has been reproduced experimentally in dogs through a combination of two factors, (a) a mechanical factor, as the production of miltiple pulmonary infarcts by the intravenous injection of an oil suspension of lycopodium; (b) an infectious factor, localized as by intratracheal injection of staphylococci or generalized as by the production of septic subcutaneous abscesses.—G. H. S.

1375. *Zur Behandlung des Pleuraempyems.* (*Treatment of Pleural Empyema.*) M. BÖNNIGER. Berl. klin. Wchnschr., 1920, **57**, 945–949.

Sixteen cases are cited in which puncture and drainage were used to remove pus from the pleural cavity.—B. C.

1376. *Lungengangrän und fusospirilläre Symbiose.* (*Lung Gangrene and Fusospirillary Symbiosis.*) H. C. PLAUT. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1384.

In lung gangrene and bronchiectasis, a careful sputum examination may reveal the presence of spirochetes and fusiform rods. In such cases the administration of salvarsan is a helpful procedure. The mixed infections are revealed only by careful staining technic and thorough examination.—B. C.

INFLUENZA

(*See also Numbers 1236, 1424, 1474, 1484*)

1377. *Ueber die Biologie der Influenzabazillen.* (*The Biology of the Influenza Bacillus.*) H. TOCUNAGA. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1357–1358.

Influenza bacilli grow upon hemoglobin that has been heated with alkali and which shows spectroscopically its decomposition to hematin and globin. Growth is far more abundant than upon unheated hemoglobin. The essential nutrient is the globin and not the iron-containing hematin. The fact that bile possesses nutrient properties proportional to its iron content probably has some special explanation.

Influenza bacilli grow upon neutral and slightly acid globin more abundantly than upon alkaline globin; but more abundantly upon alkaline hemoglobin than upon acid hemoglobin. The more globin present, the greater are the quantities of acid and alkali tolerated. Globin heated in moist condition to 70°C. remains unchanged as a nutrient; and above this temperature, the higher it is heated, the more it loses in nutritiveness. It is comparatively stable in dry heat; and acid and alkali affect it slightly, while alcohol affects it considerably.—B.C.

1378. *Grippe und Lungentuberkulose.* (*Influenza and Pulmonary Tuberculosis.*) OTTO KIEFFER. Berl. klin. Wchnschr., 1920, **57**, 951–953.

Grave tuberculous infection may occur immediately after influenza and cause an early death. Old inactive tuberculous foci may become activated again.—B. C.

1379. *Zur Frage Grippe und Lungentuberkulose.* (*The Problem of Influenza and Pulmonary Tuberculosis.*) H. ULRICI. Berl. klin. Wchnschr., 1920, **57**, 1153–1154.

Polemic against Kieffer.—B. C.

1380. *Blutbefunde bei Influenza.* (*Blood Findings in Influenza.*) ELEONORE REICHER. Schweiz. med. Wchnschr., 1921, No. 17, 394–401.

The paper deals primarily with quantitative and qualitative leucocyte counts. The bacteriological report, made upon the basis of 23 cases investigated, gives the percentage of *B. influenzae* cultures of the sputum and nasopharynx as 47 per cent.—G. H. S.

1381. *Ueber Grippebehandlung mit "Grippeimpfstoff Kalle."* (*Influenza Treatment with "Kalle Influenza Vaccine."*) CORNILS. München. med. Wchnschr., 1920, **67**, 1438–1439.

A vaccine prepared from Pfeiffer's influenza bacillus gave satisfactory improvement in 7 patients injected intravenously with 0.2 cc. of the material.—B. C.

1382. *Therapeutische Erfahrungen bei Grippe.* (*Therapeutic Experiences in Influenza.*) L. BORCHARDT AND B. LADWIG. Berl. klin. Wchnschr., 1920, **57**, 1123–1124.

Treatment of whatever kind which elicited a tissue response seemed to be favorable, more or less, in influenza. Preparations should be sought that possess in addition to a general bactericidal property also an outspoken affinity for the affected organs, especially the cardiorespiratory system.—B. C.

TUBERCULOSIS

(*See also Numbers 1244, 1245, 1287, 1337, 1338, 1378, 1379*)

1383. Calcium und Tuberkulose beim Kaninchen. (*Calcium and Tuberculosis in the Rabbit.*) RUDOLF MASSINI. Schweiz. med. Wchnschr., 1921, No. 10, 223–225.

The repeated injection of Ca in rabbits infected with *B. tuberculosis* did not materially alter the course of the infection or appreciably prolong life.—G. H. S.

1384. Tuberkulose Studien II. Ueber die Tierpathogenität des Friedmannschen sogenannten "Schildkrötentuberkelbazillus." (*Tuberculosis Studies. II. The Pathogenicity for Animals of Friedmann's So-called Turtle Tubercle Bacillus.*) W. KOLLE AND H. SCHLOSSBERGER. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1381–1382.

Friedmann's culture of turtle tubercle bacillus is absolutely harmless to rabbits, but produces pathologic changes in guinea pigs and mice. In the presence of a chronic intercurrent infection these turtle bacilli are capable of rapidly invading all organs and setting up an extensive miliary infection. There is no reason why such a condition may not also take place in man under like circumstances.—B. C.

1385. Tuberkulose Studien III. Ueber die beeinflussung der experimentellen Meerschweinchentuberkulose durch die Friedmannschen "Schildkrötentuberkelbazillen." (*Tuberculosis Studies. III. The Effect upon Experimental Guinea Pig Tuberculosis of Friedmann's Turtle Tubercle Bacilli.*) W. KOLLE AND H. SCHLOSSBERGER. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1405–1407.

"We may say in conclusion, that our studies furnish no experimental grounds which appear promising or which appear to justify the administration of Friedmann's vaccine as a cure to the tuberculous person or as a prophylactic to the healthy."—B. C.

1386. Des propriétés antigènes des Bacilles tuberculeux. (*The Antigenic Properties of the Tubercle Bacillus.*) L. GOLDENBERG. Compt. rend. Soc. de biol., Par., 1921, **84**, 973–974.

Experimental evidence is recorded in support of the following conclusions: Four day old cultures of *B. tuberculosis*, grown upon an egg yolk medium, are a complete antigen; when injected into an animal they lead to the production of specific antibody, or when combined with antibody they serve as antigen for the fixation of complement. *B. tuberculosis*, grown for 6 weeks in glycerol bouillon, is devoid of antigenic function; it does not produce antibody when injected into experimental animals, nor does it fix complement in the presence of specific tuberculosis antibody.—G. H. S.

1387. Ueber Immunisierungsversuche mit Friedmannschen Schildkrötentuberkelbazillen an Meerschweinchen und Kaninchen. (*Immunization Experiments with Friedmann's Turtle Tubercle Bacilli on Guinea Pigs and Rabbits.*) PAUL UHLENHUTH AND LUDWIG LANGE. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1407–1409.

Protective experiments in guinea pigs and rabbits yielded essentially negative results. Attempts to cure were likewise fruitless. The clinician must have the last word as the effectiveness of Friedmann's vaccine in human tuberculosis.—B. C.

1388. Ueber einige neuere Behandlungsmethoden bei Lungentuberkulose. (*Some Recent Methods of Treatment in Pulmonary Tuberculosis.*) FELIX KLEMPERER. Berl. klin. Wchnschr., 1920, **57**, 1065–1069; 1095–1099.

The lecture covers non-specific protein therapy, partigen treatment and Friedmann's turtle-bacillus cure. All three have not been successful.—B. C.

1389. Ueber Tuberkulinbehandlung mit Stauung. (*Tuberculin Treatment Combined with Stasis.*) OTTO PANETH. Wien. klin. Wchnschr., 1920, **33**, 1021–1023.

Bier's hyperemia is produced in the arm by means of light pressure (20–30 mm. Hg) and the subcutaneous injection of tuberculin is then made peripherally. The reaction is usually fully developed in 24 hours, and is quite strong owing to toxin retention. The local reaction is further strengthened by repeated injection at the same site. The therapeutic value of such treatment is still to be determined.—B. C.

1390. Ueber den klinischen Heilwert des Friedmannschen Tuberkulosemittels. (*The Clinical Therapeutic Value of Friedmann's Tuberculosis Treatment.*) J. SCHWALBE. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1410–1414.

A questionnaire was sent to representative clinicians regarding the therapeutic results observed with the Friedmann vaccine. A study of the replies leads to the conclusion that under the *most favorable* conditions, the Friedmann vaccine is only as effective as other therapeutic measures, but no better.—B. C.

1391. Therapeutische Erfahrungen mit dem Deycke-Much'schen Partialantigenen. (*Therapeutic Experiences with the Deycke-Much Partial Antigens.*) M. LANDOLT. Schweiz. med. Wchnschr., 1921, No. 18, 423–426.

The results of treatment upon two series of cases are reported; one series receiving O. T., the other, the partial antigens. The tabulated results are:

		Treated with O. T.	*Treated with partial antigens*
Mild cases	Markedly improved	27	54
	Improved	7	6
	Unaffected	..	1
Moderately advanced cases	Markedly improved	11	21
	Improved	9	5
	Unaffected	3	1
Advanced cases	Markedly improved	1	17
	Improved	14	13
	Unaffected	10	4

Of all the cases treated with old tuberculin 47.6 per cent are recorded as markedly improved, as contrasted with 75.4 per cent of those treated with the partial antigens.—G. H. S.

1392. Eine unrichtige Beurteilung der Tuberkulosebehandlung mit den Partialantigenen. (*An Incorrect Judgment of Phthisiotherapy with Partial Antigens.*) Deycke and Altstaedt. München. med. Wchnschr., 1920, 67, 1507.

The criticisms of Ott are claimed to be unjustified because he failed to employ the proper technic. Ott in reply reasserts the correctness of his unfavorable criticism.—B. C.

1393. Die Bedeutung der Partialantigene für das Tuberkuloseproblem. (*The Significance of Partial Antigens in the Tuberculosis Problem.*) Hans. Langer. Berl. klin. Wchnschr., 1920, **57**, 1120–1123.

Partial antigens indicate the presence of a toxin and bacterial immunity in tuberculosis, and to that extent modify the tuberculosis problem.—B. C.

1394. Die spezifische Behandlung der Tuberkulose durch den praktischen Arzt. (*Specific Therapy of Tuberculosis by the Practicing Physician.*) Knopf. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1414–1415.

A brief mention is made of the several methods of specific treatment and their general indications.—B. C.

1395. Ueber die spezifische Bekämpfung der Tuberkulose. (*Specific Defense Against Tuberculosis.*) A. Strübell. Berl. klin. Wchnschr., 1920, **57**, 1020–1021.

A brief statement of fundamentals is presented.—B. C.

1396. Ueber Tuberkuloseinfektion. (*Tuberculous Infection.*) W. Unverricht. Berl. klin. Wchnschr., 1920, **57**, 1019–1020.

A report is given of a case in which tuberculous infection must have occurred within 24 hours.—B. C.

1397. Procédé de recherche du Bacille de Koch dans les produits organiques tuberculeux. (*Procedure for Demonstrating the Bacillus of Koch in Tuberculous Organic Material.*) L. Hirtzmann. Compt. rend. Soc. de biol., Par., 1921, **84**, 803.

Bile is used, with boiling or with prolonged incubation, to effect solution of the organic material. Centrifugation and staining follow.—G. H. S.

1398. Ueber die Eigenharnreaktion bei Lungentuberkulose. (*The Autogenous Urine Reaction in Pulmonary Tuberculosis.*) E. Bressel. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1385–1387.

A positive reaction appears to be a certain indication of active pulmonary tuberculosis—a negative reaction, with certain exceptions, shows absence of active disease. The intensity of the reaction is usually proportional to the extensiveness of the infection. The reaction appears early in the disease, and is therefore of diagnostic importance. The reaction is, however, painful and requires elaborate laboratory facilities. The above observations are based upon a study of 50 cases.—B. C.

1399. Zur Klassifikation der Lungentuberkulose nach Bazillenausscheidung (*Classification of Pulmonary Tuberculosis According to Bacillus Elimination.*) Alfons Winkler. Wien. klin. Wchnschr., 1920, **33**, 981–984.

An attempt is made to classify the clinical stage of pulmonary tuberculosis according to the presence or absence of bacilli in the sputum.—B. C.

1400. Wie erkennt man die beginnende Tuberkulose der Lungen? (*How is Early Pulmonary Tuberculosis Recognized?*) Wilhelm Neumann. Wien. klin. Wchnschr., 1920, **33**, 1103–1109.

This lecture on the physical symptoms in tuberculosis does not lend itself to brief abstracting.—B. C.

1401. *Die Frühzeitige Feststellung der Lungentuberkulose.* (*Early Diagnosis of Pulmonary Tuberculosis.*) Litzner. München. med. Wchnschr., 1920, **67**, 1469–1470.
The interpretation of laboratory and clinical findings is discussed.—B. C.

1402. *Beitrag zur Magentuberkulose.* (*Gastric Tuberculosis.*) Wilhelm Baetzner. Berl. klin. Wchnschr., 1920, **57**, 1237.
A case is described, the prognosis of which is uncertain.—B. C.

1403. *Involvement of the Genito-Urinary Tract Associated with Active Pulmonary Tuberculosis.* Anders Peterson. Calif. State J. M., San Fran., 1921, **19**, 18.
The author served at Fort Bayard 11 months during the war. In this time, the patient population varied from 800 to 2000, practically all of whom were in the original draft age. Only 5 cases of surgical renal tuberculosis were demonstrated clinically; 3 of these had active pulmonary involvement. The author concludes from his observation, clinical and post-mortem, that surgical tuberculosis of the genito-urinary tract is not a frequent complication in patients suffering with pulmonary tuberculosis and that from a clinical standpoint tuberculosis of the genito-urinary apparatus is primary to a far greater extent than is generally considered.—J. R. S.

1404. *Isolierte Miliartuberkulose der Leber.* (*Isolated Miliary Tuberculosis of the Liver.*) Max Massini. Schweiz. med. Wchnschr., 1921, No. 8, 181–182.
Case report with discussion of the clinical manifestations and autopsy findings. Cases of this type are unusual.—G. H. S.

1405. *Beitrag zur Behandlung der Nierentuberkulose.* (*The Treatment of Renal Tuberculosis.*) Josef Winiwarter. Wien. klin. Wchnschr., 1920, **33**, 1043–1045.
Cases are cited in which an exploratory operation was necessary to determine which kidney was involved.—B. C.

1406. *Réactions immunitaires dans la tuberculose pulmonaire traitée par le pneumothorax artificiel.* (*Immunity Reactions in Pulmonary Tuberculosis Treated by Artificial Pneumothorax.*) U. Carpi. Schweiz. med. Wchnschr., 1921, No. 13, 299–300.
Marked increase in the opsonic index of the serum takes place in cases of pulmonary tuberculosis when treated by artificial pneumothorax.—G. H. S.

1407. *L'extrait de chenilles de la mite de la ruche d'Abeilles pour la guérison de la tuberculose expérimentale.* (*Extract of the Larvae of the Beehive Mite for the Treatment of Experimental Tuberculosis.*) Dublet. Compt. rend. Soc. de biol., Par., 1921, **84**, 381–382.
Acting upon a suggestion derived from the observation of Métalnikoff that *B. tuberculosis* is readily phagocytized when injected into caterpillars, the author has prepared a glycerol extract of the caterpillar and has employed it for prophylactic and curative purposes in experimental tuberculosis in guinea pigs. Manganese was added to the extract to favor lipase activity. When injections of this extract were given guinea pigs for several weeks following the inoculation of sputum or pure cultures of *B. tuberculosis* the animals remained free from infection while control pigs died. For prophylactic purposes the pigs received the extract injections for some weeks and then, together with the control animals, they were inoculated with *B. tuberculosis*. The treated animals survived, the controls died.—G. H. S.

1408. *Zur Pharmakologie und Klinik des Krysolgans.* (*Pharmacology and Clinic of Krysolgan.*) Adolf Feldt. München. med. Wchnschr., 1920, **67**, 1500–1502.
Krysolgan is a gold preparation the composition of which is not given. It is claimed to have an effect upon tuberculous foci similar to that of mercury and iodine upon syphilitic granulation tissue.—B. C.

1409. *Recherches sur la toxicité des liquides pleuraux des tuberculeux.* (*Researches upon the Toxicity of Tuberculous Pleural Fluid.*) J. Parisot and P. Simonin. Compt. rend. Soc. de biol., Par., 1921, **84**, 888–890.
The authors announce that they are about to study the factors which render certain pleural fluids toxic while similar fluids are non-toxic, or induce a delayed reaction when injected into experimental animals.—G. H. S.

DISEASES OF CHILDREN

(*See also Numbers 1237, 1487*)

1410. *Action des Bacilles diphtériques sur les hydrates de carbone.* (*Action of the Diphtheria Bacillus upon the Carbohydrates.*) Paul Durand. Compt. rend. Soc. de biol., Par., 1921, **84**, 982–983.
The fermentative reactions of 224 typical and virulent strains of *Bact. diphtheriae* were studied, with the purpose of correlating biochemical activities with serological type. Of these strains 16 belonged to the serological type I, 7 to type II, 25 to type III, 67 to type IV, 46 to type V, and 63 could not be placed in any of the above groups. Carbohydrate fermen-

tation was examined with all strains. Mannite, dulcite, sorbite, xylose, mannose, lactose, starch, inulin, and glycogen were not broken down by any of the strains. Type I fermented maltose and dextrin, was negative with glycerine and reacted but slightly with galactose. Type II fermented galactose and saccharose, but not maltose, dextrine or glycerine. Types III, IV, and V ferment glycerine, galactose, maltose, and dextrine, but not saccharose. The strains of unestablished serologic position conform for the most part to groups III, IV, and V in fermentative capacity.—G. H. S.

1411. Zur Frage der Uebertragbarkeit von Scharlach auf Diphtheriekranke.) The Transmissibility of Scarlet Fever to Diphtheria Patients.) Arthur Schlossmann. Berl. klin. Wchnschr., 1920, **57**, 965–967.

Of 3723 diphtheria patients, only 32 had scarlet fever at the same time. Study of the latter indicates the incorrectness of a current opinion that it is relatively easy to acquire scarlet fever in a diphtheria ward.—B. C.

1412. Ein seltener Fall von zweimaligen Scharlacherkrankung. (*An Unusual Case of Double Scarlet Fever Infection.*) M. Namiot. Berl. klin. Wchnschr., 1920, **57**, 1051–1053.

In the case cited, there was an interval of 10 weeks between the end of the first attack and the onset of the second. It is a question whether the latter ought to be regarded as a recidive. or as a new infection.—B. C.

1413. Die Bronchopneumonie der ersten Lebenszeit. (*Bronchopneumonia in Early Infancy.*) K. Blühdorn. Berl. klin. Wchnschr., 1920, **57**, 949–951.

Prognosis of the pneumonia in the first few weeks of life is decidedly unfavorable. Infants born at full term are rarely saved while premature infants without exception succumb to the disease if they contract it. Careful prophylaxis is the only rational defense under these circumstances.—B. C.

1414. Recherches sur la coqueluche. (*Researches upon Pertussis.*) Adolph H. Meyer. Compt. rend. Soc. de biol., Par., 1921, **84**, 425–428.

Statistical study of a large series of cases shows that *B. pertussis*, although present in demonstrable numbers in 75 per cent of the cases during the catarrhal period, is to be found in only 9 per cent after the 4th week of the convulsive period. After the 5th week the disease can be considered as practically non-infectious. A glycerol-potato medium for the cultivation of the organism is described.—G. H. S.

1415. Choleval als Prophylaktikum gegen die Blennorrhoe der Neugeborenen. (*Choleval as a Prophylactic in Ophthalmia Neonatorum.*) Hermann Koltonski. Berl. klin. Wchnschr., 1920, **57**, 954–955.

Choleval is a silver preparation in combination with the sodium salt of bile acids. It is a potent prophylactic in ophthalmia neonatorum and has the advantage of being less irritating than silver nitrate as well as less expensive.—B. C.

DERMATOLOGY

(See also Numbers 1357, 1429, 1430, 1431, 1432, 1433, 1473, 1481)

1416. Zur Uebertragung der Bartflechte (*Trichophytie*). (*The Transmission of Trichophytosis Barbae.*) Veilchenblau. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1440.

Towels used by barbers are shown to have transferred the infection.—B. C.

1417. Die Differentialdiagnose zwischen Microsporie und oberflächlicher Trichophytie des Behaarten Kopfes. (*The Differentiation Between Microsporosis and Superficial Trichophytosis of the Scalp.*) Robert O. Stein. Wien. klin. Wchnschr., 1920, **33**, 815–818.

Microsporosis in childhood is a highly communicable disease. It is readily differentiated from trichophytosis clinically, microscopically and culturally. Examination of the infected hair shows the presence of gritty-like masses of spores along the shaft in the case of infection with *Microsporon audouini*, while in trichophytosis the spores occur usually within the hairs and in the follicles. Growth of these organisms upon maltose agar is characteristically different.—B. C.

1418. Doppelseitiger Herpes zoster. (*Bilateral Herpes Zoster.*) P. Reckzeh. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1306–1307.

A case complicated with a mild typhoid fever attack is described. An infectious or toxic agent is evidently the cause of herpes zoster; and numerous cases exemplify its contagious character.—B. C.

1419. Ueber die Diphtherie der Haut. (*Diphtheria of the Skin.*) Max Winkler. Schweiz. med. Wchnschr., 1921, No. 16, 374–376.

The data are largely clinical but reports of the bacteriological findings are given.—G. H. S.

1420. Die Behandlung torpider Narbengeschwüre mit Vuzin. (*Treatment of Indolent Ulcers with Vuzin.*) Adolf Hahn. Berl. klin. Wchnschr., 1920, **57**, 1151–1153.

Injection of vuzin into indolent ulcers causes a favorable though sometimes slow response. —B. C.

OPHTHALMOLOGY

(See also Number 1415)

1421. Ueber Manifestationen der Lues am Auge bei positivem Liquorbefund. (Eye Manifestations in Syphilis with Positive Spinal Fluid.) L. Stross and A. Fuchs. Wien. klin. Wchnschr., 1920, **33**, 986–991.

In late syphilis, the clinical picture is dominated by pupillary changes, among which loss of the reflexes is common. On the other hand, in early syphilis, the optic nerves suffer change, especially in females.—B. C.

1422. Zur Quecksilberbehandlung syphilitischer Augenleiden. (Mercury Therapy in Syphilitic Ophthalmopathies.) Julius Hirschberg. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1382–1384.

Mercury is indispensable in the treatment of gummatous optic nerve inflammations in acquired syphilis.—B. C.

OTOLOGY AND NOSE AND THROAT DISEASES

1423. A Study of Nasal Conditions Occurring in Bronchial Asthma. S. Jesberg. Calif. State J. M., San Fran., 1921, **19**, 33.

A general article upon the relationship of nasal pathology to bronchial asthma. The author investigated the anaphylactic power of mucin, obtained from the antra of an asthmatic patient. This mucus was culturally sterile. Using a solution of precipitated mucin in varying dilutions cutaneous tests were made upon 13 asthmatics and 5 nonasthmatics. These tests were all negative, except for one slight reaction in a normal control. Nasal changes occur in a large percentage of asthma cases, and tend to maintain the asthma even after the primary cause has been disposed of. Therefore in cases of asthma, all nasal pathology should be corrected, whatever the means employed directly against the asthma.—J. R. S.

1424. Die stenosierende Laryngitis als Grippekomplikation. (Stenotic Laryngitis, a Complication of Influenza.) Paul Widowitz. München. med. Wchnschr., 1920, **67**, 1522.

Not infrequently, there occurs a laryngitis in influenza which is analogous to measles laryngitis. The symptoms are croupous, and treatment is purely symptomatic. Intubation is to be avoided.—B. C.

FILTERABLE VIRUSES

(See also Numbers 1365, 1366, 1367, 1368, 1369, 1370)

1425. Recherches expérimentales sur l'encéphalite épidémique. (Experimental Researches upon Epidemic Encephalitis.) C. Levaditi and P. Harvier. Compt. rend. Soc. de biol., Par., 1921, **84**, 388–390.

Two injections of 2 cc. each of the virus of epidemic encephalitis were given a rabbit intramuscularly. Disturbance first appeared on the 11th day and the rabbit died on the 12th day of encephalitis (mononuclear meningeal lesions). Nervous tissue from this rabbit was held in glycerol for 15 days and then injected intracerebrally into a second rabbit. This animal died with encephalitis in 8 days. Earlier reports that intraperitoneal injections of the virus were without effect are refuted, for later work has shown that two large doses (10 cc.) given at 8-day intervals will kill rabbits in from 13–19 days. Intracutaneous injection of the virus was without effect. After intraperitoneal injection the virus remains in the peritoneal cavity for not more than 2 days. Although the virus can be demonstrated by inoculation to be present in the nervous tissue it apparently does not invade the spinal ganglia. Intracorneal injection of the virus, and of the virus treated bile, showed that the bile rendered the virus avirulent, and the injection of such mixtures failed to confer immunity, either local or general.—G. H. S.

1426. Recherches expérimentales sur le virus de l'encéphalite épidémique. (Experimental Research upon the Virus of Epidemic Encephalitis.) C. Levaditi, P. Harvier and S. Nicolau. Compt. rend. Soc. de biol., Par., 1921, **84**, 524–528.

In experimental infection of the rabbit the incubation period after intracerebral inoculation is characterized by a rise in temperature on the 2nd or 3rd day after the injection. The temperature quickly reaches 41°C. This degree of fever persists until obvious symptoms ensue. Usually, shortly before the death of the animal, the temperature drops to below normal. There is a marked polymorphonuclear leucocytosis, associated with a diminution in the number of lymphocytes. The red cell counts do not vary but the erythrocyte fragility is increased.

When the virus is injected into the anterior chamber of the eye it passes rapidly to the brain by way of the optic nerve. Removal of an inoculated eye or scarified and inoculated cornea after 24 to 48 hours does not protect the animal, since within this time the nervous tissue has been invaded. In the rabbit the virus possesses a marked affinity for the neurones, attacking in an apparently elective manner the cortical cells in the region of the hippocampus. Early after invasion of the virus pyknotic polynuclear cells accumulate about the nerve cells and apparently the virus, localized in the neurones, liberates a leucolytic principle. Invasion of the meninges by mononuclear cells then occurs. Corneal inoculation results in conjunctivitis and keratitis, as well as extended invasion of the nervous tissues.

After intracerebral inoculation in the rabbit bodies resembling Negri bodies are demonstrable in the hippocampus.

Convalescent serum only partially neutralizes the virus *in vitro* against intracerebral inoculation; neutralization effects are much more pronounced if the injections are made into the cornea or are intraocular. When 1 volume of the virus is mixed *in vitro* with 2 volumes of normal human serum and incubated at 37°C. for 5 hours no attenuation occurs as determined by corneal inoculation, but when mixed in the same way with a convalescent serum keratitis and death are prevented. The serum of a sheep, which had received subcutaneous injections of the nervous tissue of rabbits dead of encephalitis, also showed neutralizing effects, and a positive Bordet-Gengou reaction with infected brain tissue was secured with this serum.

Anesthesia—chloroform, ether, chloral—enhances the virulence of the virus.

Prolonged and rapid centrifugalization of an emulsion of infected nervous tissue does not free the supernatant fluid of pathogenic properties. A virulent emulsion can be diluted 1:1000 and be infective upon intracerebral inoculation. Dried virus is still active after 40 days at room temperature. The virus is not diffusible. Simple instillation of the virus into the conjunctival sac is without effect; if, however, the cornea has received the slightest damage infection takes place.—G. H. S.

1427. *Sur la présence, dans la salive des sujets sains, d'un virus produisant la kérato-conjonctivite et l'encéphalite.* (*Upon the Presence in the Saliva of Healthy Subjects, of a Virus Producing Kerato-Conjunctivitis and Encephalitis.*) C. Levaditi, P. Harvier, and S. Nicolau. Compt. rend. Soc. de biol., Par., 1921, **84**, 817–818.

The saliva of a normal person, at least in certain instances, will induce a keratitis and conjunctivitis when inoculated into the scarified cornea of the rabbit. This infection appears after 24 to 48 hours and in all essentials resembles the infection caused by the filtrable virus of encephalitis or by the use of herpes (as described by Blanc and Caminopetros). The infection can be transmitted from rabbit to rabbit by corneal inoculation. Saliva of some individuals does not cause this keratitis although its inoculation may lead to the death of the animal on the 8th day with lesions absolutely identical with those of experimental encephalitis. The lesions are, however, usually less marked. Rabbits which have corneal infections due to the inoculation of saliva are not immune to infection with the encephalitic virus. None of the aerobic or anaerobic organisms of the saliva seem to be associated with the process. The virus of the saliva appears to be associated with the cellular elements; since after centrifugation the sedimented material is much more infective than the supernatant fluid. Chamberland filtrates of saliva are less infective than non-filtered material; although they are virulent.—G. H. S.

1428. *Transmission expérimentale du virus de l'encéphalite de la mère au foetus.* (*Experimental Transmission of the Virus of Encephalitis from Mother to Fetus.*) C. Levaditi, P. Harvier and S. Nicolau. Compt. rend. Soc. de biol., Par., 1921, **84**, 957–959.

The passage of the virus through the placenta is recorded. A pregnant rabbit was injected with the virus by the intraocular route and death occurred on the 11th day. The disease was transmitted to other rabbits by inoculation with the brain, mammary glands, and placenta of this rabbit, and by the brain, but not by the liver, of the fetus.—G. H. S.

1429. *Recherches expérimentales sur l'herpès.* (*Experimental Research upon Herpes.*) Georges Blanc and Jean Caminopetros. Compt. rend. Soc. de biol., Par., 1921, **84**, 629–630.

When the scarified eye of the rabbit is inoculated with the contents of a herpetic vesicle a pronounced reaction takes place, usually within 12 hours. The formation of minute vesicles is followed by a keratitis, a conjunctivitis, and an abundant purulent secretion. A marked cellular reaction occurs consisting of polymorphonuclear, pseudoeosinophil and epithelial cells, within which inclusion bodies may be demonstrated by Romanowsky staining. Ulceration and hypopyon may occur. The pus yields sterile cultures but the virus from the eye is transmissible from rabbit to rabbit without apparent effect upon virulence. The virus is filtrable. After recovery from infection of one eye no immunity to infection of the other eye obtains, although reinfection of the eye first inoculated does not occur. Laboratory animals other than the rabbit are resistant, with the possible exception of the guinea pig. The herpetic keratitis is specific; materials from other cutaneous lesions fail to produce lesions of the type described.—G. H. S.

1430. *Recherches expérimentales sur l'herpès.* (*Experimental Research upon Herpes.*) Georges Blanc and Jean Caminopetros. Compt. rend. Soc. de biol., Par., 1921, **84**, 767–770.

The virus secured from the herpetic vesicle leads to a fatal encephalitis when introduced by subdural injection into the rabbit. Clinically and in its anatomical and pathological manifestations the process resembles that described by Levaditi and Harvier in experimental epidemic encephalitis in the rabbit. The incubation period is 4 to 6 days. Fatal infection can be secured with fresh virus from the herpetic lesion or from the herpetic keratitis of the rabbit. Several passages of the virus through the nervous system give a fixed virus. Typical herpetic keratitis of the rabbit can be induced by inoculation of the cornea with the nervous tissue of a rabbit dying of the encephalitis. Apparently a strong local reaction—as an intense keratitis—produces sufficient immunity to protect the animal from the usual effects of a subdural injection.—G. H. S.

1431. *Recherches expérimentales sur l'herpès.* (*Experimental Research upon Herpes.*) **Georges Blanc and Jean Caminopetros.** Compt. rend. Soc. de biol., Par., 1921, **84**, 859–860.

Material derived from a herpetic vesicle located on the genitalia caused experimental infection of the rabbit just as material from cases of buccal herpes had done. Guinea pigs are less susceptible to the virus than rabbits; mice are somewhat sensitive; dogs are resistant, as are pigeons and cold blooded animals.—G. H. S.

1432. *Das Virus des Herpes febrilis und seine Beziehungen zum Virus der Encephalitis epidemica (lethargica).* (*The Virus of Herpes Febrilis and its Relation to the Virus of Epidemic Encephalitis.*) **R. Doerr and A. Schnabel.** Schweiz. med. Wchnschr., 1921, No. 20, 469–472.

Certain experiments of the authors are incorporated in a literature review. From the experimental study it appears that the virus of herpes and that of encephalitis are closely related. The symptomatology and the lesions of experimental infection in the rabbit are the same with both viruses, and a corneal infection with one virus renders the eye resistant to infection with the other virus.—G. H. S.

1433. *Weitere experimentelle Beiträge zur Aetiologie und Verbreitungsart des Herpes febrilis beim Menschen.* (*Further Experimental Contribution to the Etiology and Epidemiology of Herpes Febrilis.*) **R. Doerr and A. Schnabel.** Schweiz. med. Wchnschr., 1921, No. 24, 562–564.

Evidence is presented indicating that the herpes virus is to be found in the saliva, and that all strains of the virus are of the same nature. Further work supports the idea that the herpes virus is identical with the virus of encephalitis lethargica.—G. H. S.

1434. *Sur une maladie a virus filtrant, chez le cobaye.* (*A Disease of Guinea Pigs Due to a Filtrable Virus.*) **Jonesco-Mihaiesti.** Compt. rend. Soc. de biol., Par., 1921, **84**, 1014–1016.

A virus is described which causes typical and constant infection in inoculated guinea pigs. The virus was originally secured from a monkey which had been used in typhus work The guinea pig infection is characterized by marked temperature changes, and by the death of the animal after a constant incubation period. The virus is filtrable and can be secured from all of the organs of an animal dying of the infection. Infection is not transmitted spontaneously. Rabbits are not susceptible. Emulsions of brain tissue maintain their virulence for 4 months when preserved in sealed tubes at room temperature.—G. H. S.

1435. *Zur Klinik und Pathologie des Fleckfiebers mit Berücksichtigung chirurgischer Komplikationen.* (*Clinic and Pathology of Typhus Fever with regard to Surgical Complications.*) **Karl Michl.** Wien. klin.. Wchnschr, 1920, **33**, 1127–1131.

The pathology of typhus fever is considered from the standpoint of the clinician.—B. C.

SURGICAL BACTERIOLOGY

(*See also Numbers 1347, 1462*)

1436. *Zur Behandlung des Tetanus.* (*The Treament of Tetanus.*) **W. Seidelmann.** Berl. klin Wchnschr., 1920, **57**, 1125– 1126.

A case is cited in which it was necessary to administer the antitoxin intracerebrally. The treatment was successful.—B. C.

1437. *Lésions du système nerveux dans les infections par anaérobies.* (*Lesions of the Nervous System in Anaerobic Infections.*) **Paul Van Gehuchten.** Compt. trend. Soc. de biol., Par., 1921, **84**, 550–551.

Guinea pigs injected with cultures of *B. perfringens*, *V. septique*, or *B. histolyticus* die within 14 to 100 hours. When death occurs within 2 days lesions of the central nervous system are not marked, but in animals living longer definite lesions are present, but they can hardly be sufficient to warrant the assumption that death is due to a paralysis of the central nervous system.—G. H. S.

1438. *Prüfung von Gasbrandserum gegen den Fraenkelschen Gasbazillus.* (*Testing of Gas Gangrene Serum against Fraenkel's Gas Bacillus.*) **Eugen Fraenkel and Johannes Zeissler.** Berl. klin. Wchnschr., 1920, **57**, 1017–1019.

Prophylactic tests were made upon guinea pigs with weighed amounts of inoculum. The serum was injected subcutaneously 24 hours before, or intraperitoneally 4 hours before the intramuscular inoculation of the organisms. This standardization of the technic yielded consistent experimental results.—B. C.

1439. Flore bactérienne de grands suppurants dans un service chirurgicale. (*Bacterial Flora of Suppurative Conditions in a Surgical Service.*) M. Breton, V. Grysez and P. Crampon. Compt. rend. Soc. de biol., Par., 1921, **84**, 398–400.

Careful study of 25 cases of severe suppurative conditions revealed the following organisms present in the percentages indicated:

	per cent
Streptococcus and pseudo-diphtheria	4
Streptococcus, pseudo-diphtheria, pyocyaneus	4
Streptococcus in pure culture	4
Staphylococcus and pseudo-diphtheria	12
Staphylococcus and pyocyaneus	8
Staphylococcus, pesudo-diphtheria, coli	4
Staph., pseudo-diphth., pyocyaneus, Friedländer	4
Staphylococcus in pure culture	36
B. coli and enterococcus	4
B. coli in pure culture	16
Pseudo-diphtheria in pure culture	4

Particular attention is called to the high percentage of cases yielding the staphylococcus and *B. coli* in pure cultures, as well as to the very frequent association of pseudo-diphtheria with the other organisms. This last organism, designated as *cutis communis*, is characterized: Gram-positive, non-motile, short, polar granulations, few involution forms. Growth with heavy precipitate in bouillon and with creamy surface layer on agar. Indol negative, neutral red negative. Lactose−, glucose+, saccharose+, maltose−, raffinose−, levulose+ dulcite−, mannite−.—G. H. S.

1440. Variabilité des réactions humorales, au cours des périodes d'infection des plaies chirurgicales. (*Variability of Humoral Reactions, in the Course of Periods of Infection of Surgical Wounds.*) M. Breton, V. Grysez and P. Crampon. Compt. rend. Soc. de biol., Par., 1921, **84**, 597–598.

Further investigation was made of the conclusion reached by Levaditi that in an infected individual the intradermal reaction indicates the degree of resistance; an intense reaction meaning an effective resistance, a weak or negative reaction indicating no resistance. Various organisms in various types of infection were used and the conclusion of Levaditi was confirmed in its essentials. During the acute period of the infection the homologous organism causes no reaction (although heterologous strains of the same bacterial species may induce a reaction) but as recovery occurs the intradermal reaction manifests itself.—G. H. S.

1441. Recherche de précipitines dans les sérum des blessés encours d'infection; rapports avec la spécificité microbienne. (*Precipitations in the Serum of the Wounded during Infection; Relation to Bacterial Specificity.*) M. Breton, V. Grysez and P. Crampon. Compt. rend. Soc. de biol., Par., 1921, **84**, 693–694.

Chamberland filtrates of 4-day old cultures of various organisms were combined in the precipitin tests with sera derived from individuals with suppurating wounds. Specific reactions were secured; in some cases the reactivity of the serum extended to closely allied but heterologous strains. The reaction is to be secured rather late in the infection and there does not appear to be a parallelism between the precipitin test and the intradermal reactions with the same antigens.—G. H. S.

1442. B. proteus des plaies de guerre. (*B. proteus in War Wounds.*) M. Weinberg and I. Otelesco. Compt. rend. Soc. de biol., Par., 1921, **84**, 535–536.

The 8 strains studied (all culturally *B. proteus*, Hauser, and of the same antigenic type) showed marked pathogenicity when injected intramuscularly into guinea pigs. The significance of *B. proteus* in association with anaerobes in wounds is emphasized, since the organism is not only active itself but it intensifies the activity of such organisms as *B. perfringens*, *V. septique*, *B. edematiens*, *B. fallax*, *B. histolyticus*, ans *B. bifermentans*. On the other hand, *B. proteus* tends to neutralize the effects of certain strongly proteolytic organisms, as *B. sporogenes* and *B. putrificus*, and in many instances the lesions associated with such mixed infections may be ascribed primarily to *B. proteus*. Contrary to general opinion, *B. proteus* very frequently invades the blood stream. Normal sera possess an antihemolytic property which is very active against the hemolysin of *B. proteus*.—G. H. S.

1443. Metallfolien in der praktischen Chirurgie. (*Metal Foil in Practical Surgery.*) Gretsel. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1390.

Tin and aluminium foil were found to be very effective coverings for wounds.—B. C.

1444. Die Schleiermethode bei der Behandlung infizierter Wunden. (*The "Veil" Method in Treating Infected Wounds.*) Hermann Marschik. Wien. klin. Wchnschr., 1920, **33**, 1109–1111.

The infected wound is thoroughly cleaned by radical removal of all possible infected tissue; and it is then surrounded by pads of iodoform gauze, upon which is laid a "veil' or cover of sterile or iodoform gauze. Granulation is thus stimulated and secondary infection largely prevented.—B. C.

SEROLOGY

(*See also Numbers 1318, 1406, 1440, 1441, 1469*)

1445. Quelques données techniques sur chacune des variables de l'agglutination typhique. (*Technical Data upon Each of the Variables of Typhoid Agglutination.*) A. Beckerich and G. Engel. Compt. rend. Soc. de biol., Par., 1921, **84**, 672–674.

The various factors which influence agglutination were studied. The strain of organism employed is important; with the 5 strains of *B. paratyphosus* B studied the agglutinability varied between 1:3000 and 1:50,000, and of 18 strains of *B. typhosus* 1 agglutinated up to 1:50,000 4 at 1:30,000, 3 at 1:20,000, 5 at 1:10,000, 1 at 1:5,000, and 4 at 1:3000. The state of the antigen is of significance; formol-killed organisms yielded most constant results. The concentration of organisms in the bacterial emulsion is susceptible to variation and thus leads to error. Estimation of the number may be made by various methods, and the most suitable concentration should be about 1000 million per cc. Temperature is an important factor; similar results are secured at (a) 1 hour at 37° followed by 18 hours at 20°C., (b) 6 hours at 37°C. (c) 1¾ hours at 56°C., or (d) 60 hours at 7–10°C.—G. H. S.

1446. Contribution a l'étude biologique du liquide céphalorachidien au cours de la syphilis nerveuse par la réaction de précipitation du benjoin colloïdal. (*Biological Study of the Cerebro-Spinal Fluid, in the Course of Nervous Syphilis, by the Precipitation Reaction with Colloidal Benzoin.*) Julien Huber. Compt. rend. Soc. de biol., Par., 1921, **84**, 496–498.

The diagnostic value of the precipitation reaction between colloidal benzoin and cerebrospinal fluid in 27 cases of syphilis of the nervous system was tested. In 9 control cases, of various types of disease, the precipitin reaction was negative as was the Wassermann. In 3 cases, presumably syphilis but without obvious involvement of the central nervous system, the benzoin precipitation was negative. In 7 cases of active syphilis of the nervous system the reaction corresponded with the fixation in the spinal fluid, but did not uniformly agree with the blood Wassermann. In another group of cases the benzoin precipitation was positive while theWassermann reactions were doubtful or negative upon the spinal fluid and negative with the blood. In this group the clinical symptoms—gastric crises, hemiplegia, etc.—indicated syphilitic infection. In 4 other nervous cases (encephalitis, etc.) the reactions were negative and agreed with the blood and spinal fluid Wassermann reactions.—G. H. S.

1447. Note sur le réaction de précipitation du benjoin colloïdal dans le liquide céphalorachidien (*Guillian, Guy Laroche et Léchelle*) *et sur la formol-gélification des sérums syphilitiques* (*Gaté et Papacostas*). (*The Colloidal Benzoin Precipitation Reaction with the Cerebro-Spinal Fluid* (*Guillian, Guy Laroche and Léchelle*) *and the Formol Gelatinization of Syphilitic Serum.* (*Gaté and Papacostas*).) Pauzat. Compt. rend. Soc. de biol., Par., 1921, **84**, 503–504.

The results are given in detail and confirm the statements made regarding the great value of the colloidal benzoin reaction. The reaction of formol coagulation seems less trustworthy. In 11 cases with a positive Wassermann the formol reaction was positive in 3 and negative in 8; in 46 negative Wassermann sera the formol reaction was positive in 6 and negative in 40. —G. H. S.

1448. Disposition colloïdale particulière aux sérums des syphilitiques et aux sérums dit "anticomplementaires." (*Colloidal State Peculiar to the Serum of Syphilitics and to the So-Called Anticomplementary Serums.*) Edouard Peyre. Compt. rend. Soc. de biol., Par., 1921, 84, 536–537.

Ultramicroscopic examination and the Wassermann reaction were performed on 100 sera. Distinct ultramicroscopic differences were noted; the finely granular sera with particles of uniform size and great motility gave uniformly negative fixation reactions, those sera showing granulations of variable size and motility gave positive fixation or were anticomplementary. It is not suggested that this is a valid diagnostic measure.—G. H. S.

1149. Étude de la réaction du benjoin colloïdal et de la réaction de Bordet-Wassermann pratiquées sur les liquides céphalorachidiens xanthochromiques. (*The Colloidal Benzoin Reaction and the Bordet-Wassermann Reaction with Xanthrochromic Cerebrospinal Fluid.*) Georges Guillian and Guy Laroche. Compt. rend. Soc. de biol., Par., 1921, **84**, 966–967.

The colloidal benzoin reaction can not be employed on xanthrochromic fluids such as are frequently encountered in cerebral tumors, or conditions involving meningeal hemorrhage. In such cases precipitation occurs in the syphilitic zone and is devoid of specificity from the point of view of diagnosis. In much the same way the Wassermann reaction is of questionable value under the same conditions. In such fluids positive reactions with the unheated fluids often become negative after inactivation for 30 minutes at 56°C. A parallelism between the two reactions is obvious.—G. H. S.

1450. Technique simplifiée de la réaction du benjoin colloïdal pour le diagnostic de la syphilis du névraxe. (*Simplified Technic for the Colloidal Benzoin Reaction in the Diagnosis of Syphilis of the Nervous System.*) Georges Guillian, Guy Laroche and P. Lechelle. Compt. rend. Soc. de biol., Par., 1921, **85**, 4–5.

Instead of the 16 tubes required for the original method but 5 tubes are required in the technic proposed.—G H. S.

1451. La réaction de Sachs-Georgi dans la syphilis héréditaire. (*The Sachs-Georgi Reaction in Hereditary Syphilis.*) L. DE CASTRO FREIRE AND ANTONIO DE MENEZES. Compt. rend. Soc. de biol., Par., 1921, **84**, 989–991.

The reaction was conducted upon 102 specimens; 60 of blood and 42 of cerebrospinal fluid. The Sachs-Georgi reaction and the Wassermann reaction conformed in 74.4 per cent of the cases; 70.3 per cent with the serum and 80 per cent with spinal fluid. It thus appears that in hereditary syphilis the reactions agree in about as high a percentage as in other forms of syphilitic infection. In cases of this type, where the Sachs-Georgi reaction is to be performed the spinal fluid offers the most satisfactory material for test.—G. H. S.

1452. Variations der propriétés du sérum antityphique en rapport avec les conditions d'immunisation. Propriété bactéricide. (*Variations in the Properties of Antityphoid Serum in Relation to the Conditions of Immunization. Bactericidal Properties.*) A. RODET. Compt. rend. Soc. de biol., Par., 1921, **84**, 739–742.

When *B. typhosus* is combined with an inactivated specific immune serum in the presence of complement, one of two results may follow, depending upon qualitative and quantitative relationships. The organisms may be sensitized to the antibodies of the serum, or the complement may be inhibited by some opposing factor of the serum. It is claimed that these reactions—the one bactericidal, the other antibactericidal—are due to special properties of the serum. Protocols illustrating these activities are given.—G. H. S.

1453. Die Bedeutung der positiven Schwankung der SR unter der Salvarsanbehandlung seronegativer Primärsyphilis. (*The Significance of the Positive Fluctuation of the Serum Reaction during Salvarsan Therapy of Sero-negative Primary Syphilis.*) GENNERICH. München. med. Wchnschr., 1920, 67, 1442–1444.

Reports of certain clinicians of failure to arrest sero-negative primary syphilis with salvarsan are not enough to condemn salvarsan in this regard.—B. C.

1454. La pouvoir agglutinant du sang chez l'escargot en hibernation. (*The Agglutinating Power of the Blood in the Snail during Hibernation.*) X. CHAHOVITCH. Compt. rend. Soc. de biol., Par., 1921, 84, 731–732.

The presence of normal agglutinins for *B. coli* and *B. pyocyaneus* in snails, together with the capacity of these animals to elaborate agglutinins was determined. It was found that during hibernation the blood was able to agglutinate both of these antigens in low dilutions (1:10 after 3 hours). Inoculation of the snails with the antigens did not increase the agglutinin titre of their blood.—G. H. S.

1455. Le pouvoir précipitant du sang chez l'escargot en hibernation. (*The Precipitating Power of the Blood of the Snail during Hibernation.*) X. CHAHOVITCH. Compt. rend. Soc. de biol., Par., 1921, **84**, 987–988.

Normal precipitins for culture filtrates of *B. coli* or *B. pyocyaneus*, or for dog serum, are not present in the blood of the snail, nor can precipitins for such antigens be induced by injections given during hibernation.—G. H. S.

1456. Influence de la température sur le mécanisme de l'immunité humorale chez les insectes. (*Influence of Temperature upon the Mechanism of Humoral Immunity in Insects.*) A. PAILLOT. Compt. rend. Soc. de biol., Par., 1921, **84**, 737–739.

Caterpillars inoculated with *B. melolonthae non liquefaciens* γ if kept at 24°C. quickly dispose of the organisms. If similar experiments are performed at 10° lysis does not take place; the transformation of the organisms into granular form being accomplished much more slowly. A distinct independence between the phagocytic and the humoral (lytic) resistance is shown.—G. H. S.

1457. Sur une note de MM. Couvreur et Chahovitch concernant la défense contre les infections microbiennes chez les insectes. (*The Defense of Insects against Bacterial Infections.*) A. PAILLOT. Compt. rend. Soc. de biol., Par., 1921, **84**, 978–979.

Polemical.—G. H. S.

1458. Quelques remarques au sujet d'une infection expérimentale chez Maia squinado. (*Experimental Infection in the Crab, Maia squinado.*) J. CANTACUZÈNE. Compt. rend. Soc. de biol., Par., 1921, **84**, 1007–1010.

The blood of the crab (*Maia squinado*) normally contains agglutinins for sheep cells and for *B. typhosus*, but none for *V. cholerae*. Changes in the agglutination capacity for *B. typhosus* during experimental infection with an organism isolated from the intestinal tract of the crab are reported. The relationship between blood agglutinins and agglutinins contained in the tissue juices were investigated.—G. H. S.

1459. Ueber der Wesen und die Entstehung der Antikorper. (*The Nature and Origin of Antibodies.*) H. SAHLI. Schweiz. med. Wchnschr., 1920, No. 50, 1129–1139; No. 51, 1153–1163.

An analysis of the present theories of antibody formation, particularly those of Ehrlich and Landsteiner. The author supports the hypothesis that antibody formation is simply a form of physiologic blood regeneration and over-regeneration.—G. H. S.

1460. Bermerkungen zu der Arbeit von Sahli: Ueber das Wesen und die Entstehung der Antikorper. (Remarks upon the Work of Sahli: Concerning the Form and Constitution of Antibodies.) M. NEISSER. Schweiz. med. Wchnschr., 1921, No .12, 268–269.
Polemical.—G. H. S.

1461. Bemerkungen zu dem vorstehenden Aufsatz von Herrn Professor Neisser. (Remarks upon the Foregoing Paper of Professor Neisser.) H. SAHLI. Schweiz. med. Wchnschr., 1921, No. 12, 269–272.
Polemical. (See Abstract No. 1460.)—G. H. S.

SERUM THERAPY

(See also Numbers 1304, 1436, 1438)

1462. Zur Prophylaxe und Therapie der postoperativen Pneumonie. (Prophylaxis and Therapy of Postoperative Pneumonia.) EUGEN SPECKER. Schweiz. med. Wchnschr., 1921, No. 24, 549–554.

An analysis is presented of the use of "polyvalent" serum as a prophylactic and therapeutic agent in preventing and treating postoperative pneumonia. In 37 of over 900 operative cases the condition of the patient at the time of operation suggested the possibility of a postoperative pneumonia. These were given a prophylactic injection of the serum. None developed pneumonia. In 9 cases of post-operative pneumonia therapeutic injections were given and all of the cases responded promptly to the treatment. For therapeutic purposes early administration and adequate dosage are insisted upon.—G. H. S.

1463. Production rapide d'un sérum anticharbonneux actif vis-à-vis de cobaye. (Rapid Production of Antianthrax Serum Active in Guinea Pigs.) A. STAUB AND P. FORGEOT. Compt. rend. Soc. de biol., Par., 1921, **84**, 713–716.

Rabbits were given daily intravenous injections of asporogenous *B. anthracis* for 10 days. The bacteria were killed by alcohol and ether and at each injection 1 centigram of dried organisms suspended in 5 cc. of saline was given. Ten days after the last injection the sera showed marked complement fixing power but relatively slight agglutinating properties. In 2 cc. amounts, when injected subcutaneously 24 hours before the infecting dose, the sera protected guinea pigs against a fatal dose of *B. anthracis*.—G. H. S.

1464. Injections au cheval de Streptocoque équin traité par l'alcool-éther. (Injections into the Horse of Equine Streptococcus Treated by Alcohol-Ether.) BROCQ-ROUSSEU. Compt. rend. Soc. de biol., Par., 1921, **84**, 445–446.

Streptococcus equinus after treatment with alcohol and ether was injected repeatedly into horses by the intravenous route. Judging by the temperature response at the later injections a certain degree of immunity was established.—G. H. S.

1465. Modifications de la coagulabilité sanguine au cours de la sérothérapie. (Modification of the Coagulability of the Blood in the Course of Serotherapy.) LEON BINET. Compt. rend. Soc. de biol., Par., 1921, **84**, 818–819.

Experimental evidence is brought forward to show that after the injection of a serum, changes in the coagulability of the blood ensue. Two distinct reactions occur, a first phase immediately following the injection when the blood shows a hypercoagulability; and a second phase, somewhat delayed, when the blood is hypocoagulable.—G. H. S.

1466. Immunisation passive par des séroplasmes administrés per os. (Passive Immunization by Seroplasma Administered by Mouth.) HENRI DE WAELE. Compt. rend. Soc. de biol. Par., 1921, **84**, 843–844.

The effects of the administration *per os* of Witte's peptone seroplasma were studied. The incoagulable plasma secured at the time of shock is inert if administered by intravenous injection but when given *per os* it is subjected to such a modification that an active principle is liberated which causes a certain degree of passive immunity. The filtrate of a plasma which has been coagulated at 100°C. is inactive when given by mouth and only partially recovers its activity by the addition of complement. When diluted with distilled water the plasma confers a specific immunity upon homologous and herterologous animals. An anti-egg white seroplasma will protect a hypersensitive guinea pig against shock if given *per os* 6 to 24 hours before the intoxicating injection.—G. H. S.

HYPERSENSITIVENESS—ANAPHYLAXIS, ALLERGY

1467. Action antianaphylactique des eaux minérales (Vichy). (Antianaphylactic Effect of Mineral Water (Vichy).) F. ARLOING AND P. VAUTHEY. Compt. rend. Soc. de biol., Par., 1921, **84**, 519–521.

Guinea pigs sensitized with 0.1 cc. of horse serum received daily subcutaneous injections of 2 to 4 cc. of 0.5 per cent sodium bicarbonate of Vichy water for a period of 10 to 20 days. The intoxicating injection of serum was given intracerebrally. Small amounts (2 cc. per day) of the alkali or of the water failed to ward off shock, but the larger amounts (3 to 4 cc.)

attenuated or suppressed acute anaphylaxis. When injections were given for 20 days the results were more marked than after shorter periods of treatment. In studying the physical factors of the sera in animals repeatedly injected with such mineral waters it was found that the surface tension was not constantly changed, but that the viscosity was markedly altered —with the sodium bicarbonate solution from 1.35 to 1.48 and with the mineral water from 1.40 to 1.75.—G. H. S.

1468. Du choc anaphylactique au cours de l'intoxication diphthérique expérimentale. (*Anaphylactic Shock in the Course of Experimental Diphtheria Intoxication.*) Fernand Arloing and Lucien Thévenot. Compt. rend. Soc. de biol., Par., 1921, **84**, 975–976.

Recognizing the favorable effect of anaphylactic shock upon the course of *B. pyocyaneus* infection, experiments were conducted to determine what effect shock might have upon the course of the diphtheria toxin reaction. The results show that anaphylactic shock does not decrease the intensity of the local reaction to diphtheria toxin, nor modify the course of fatal intoxication.—G. H. S.

1469. Pouvoir agglutinant microbien du sérum sanguin et choc anaphylactique. (*Bacterial Agglutinating Potency of Blood Serum and Anaphylactic Shock.*) F. Arloing, Lucien Thévenot and L. Langeron. Compt. rend. Soc. de biol., Par., 1921, **84**, 977–978.

Rabbits and guinea pigs, whose serum contained agglutinins for *B. tuberculosis* and *B. pyocyaneus*, were subjected to anaphylactic shock. The results were inconstant. In 7 of 10 animals the agglutinin titre was not changed; in 3 a decrease in titre occurred. No relation between the intensity of the shock and the change in titre could be detected; nor was there any direct correlation between change in titre and alteration in the leucocyte count.—G. H. S.

1470. Anaphylaxie et chimiotaxie. (*Anaphylaxis and Chemiotaxis.*) S. Metalnikow. Compt. rend. Soc. de biol., Par., 1921, **84**, 932–934.

In the immune animal the inflammatory reaction manifests itself much more rapidly than in the normal animal. In such an immune animal the chemiotactic forces leading to an accumulation of leucocytes are more sensitive. In a sensitized animal a similar increase in chemotactic activity is manifest, but if the animal is desensitized no increased chemotaxis is shown. Sensitized animals, when subjected to the effects of narcotics, no longer have a high chemotactic activity. From these observations the author reasons that anaphylactic shock is the result of excessive activity of cells sensitized by immunization.—G. H. S.

1471. Der gegenwärtige Stand der Lehre von der Eiweissüberempfindlichkeit. (*Our Present Knowledge Regarding Protein Hypersensitiveness.*) Wolfgang Weichardt. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1422–1423.

A brief general review is presented.—B. C.

1472. Die gegenwärtige Auffassung und Behandlung der Eklampsie. (*The Present View and Treatment of Eclampsia.*) R. Jolly. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1364–1365.

Eclampsia, its symptoms and treatment, are discussed in a general way.—B. C.

VACCINE PROPHYLAXIS AND THERAPY

(*See also Numbers 1303, 1340, 1361, 1381 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392, 1393*)

1473. Ueber den Wert der Revakzination bei der Pockenschutzimpfung. (*The Value of Revaccination in Smallpox Prevention.*) Paschen. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1359–1360.

Revaccination is absolutely necessary for maintaining a sufficient degree of immunity. The view of Jürgens that revaccination does not protect is shown to be incorrect.—B. C.

1474. Ueber spezifische Behandlung der Grippe. (*Specific Treatment of Influenza.*) Kurt Bayer. München. med. Wchnschr., 1920, **67**, 1493–1495.

A vaccine composed of numerous strains of influenza bacilli was injected intravenously into patients with influenza. This produced a marked reaction with favorable clinical results. Several typical cases are cited. This vaccine produced little or no reaction in two cases of gonorrheal arthritis.—B. C.

1475. Die Bakteriologie der chronischen postgonorrhoischen Prostataentzündungen nebst therapeutischen Versuchen mittels Autovakzinen. (*Bacteriology of Chronic Post-gonorrheal Prostatitis and Therapeutic Trials with Autogenous Vaccines.*) Th. Messerschmidt and Walther. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1416.

In chronic prostatitis, the exudate contains different types of bacteria. An autogenous mixed vaccine containing these different types may improve the condition without the aid of other therapeutic measures.—B. C.

1476. Zur Bakteriotherapie der Koinfektionen und gonorrhoischer Erkrankungen. (*The Bacteriotherapy of Coli and Gonococcus Infections.*) Th. Fürst. München. med. Wchnschr., 1920, **67**, 1520–1521.

Coli infections of the urinary tract may be improved by specific vaccine injections. The effects of treatment may be followed by the leucocyte content of the urine. A bacteriuria is however not eliminated by this treatment.

The complement fixation test may be used as an index of improvement in gonorrhea following non-specific protein therapy.—B. C.

1477. Zur Autovakzinebehandlung des Unterleibstyphus. (*Autogenous Vaccine Treatment of Abdominal Typhoid.*) Roger Korbsch. Berl. klin. Wchnschr., 1920, **57**, 1196–1199.

Autogenous vaccine administered in typhoid fever is not a dangerous procedure, and helps to modify and shorten the disease to some extent.—B. C.

1478. Sur un mode particulier de préparation de vaccin contre les affections pulmonaires. (*A Special Method of Preparing Vaccines against Pulmonary Infections.*) J. Minet and A. Benoit. Compt. rend. Soc. de biol., Par., 1921, **84**, 391–392.

The failure of stock vaccines and of many autogenous vaccines in the treatment of certain pulmonary conditions is ascribed to the fact that in such mixed vaccines the formula is arbitrary and bears no relation to the numerical ratios in which the various organisms are present. It is suggested that such a numerical evaluation of the organisms present be made by direct count of sputum smears and that the organisms noted be combined in the vaccine in corresponding numbers.—G. H. S.

1479. Appareil de dosage des vaccins bactériens: diaphanomètre bactérien. (*Apparatus for Counting Bacterial Vaccines: Bacterial Diaphanometre.*) Leopold Robert. Compt. rend. Soc. de biol., Par., 1921, **84**, 820–822.

An apparatus, constructed upon the principle of the Sahli hemoglobinometer, is described for use in determining the number of bacteria in a suspension. The application to the standardization of bacterial vaccines is emphasized.—G. H. S.

1480. Pyothérapie et ptysmathérapie. Méthodes d'auto-vaccination curative. (*Pyotherapy and Sputum Therapy. Methods of Curative Auto-Vaccination.*) G. Vallet. Compt. rend. Soc. de biol., Par., 1921, **84**, 710–711.

In autopyotherapy sterile and homogenized pus is inoculated; in autoptysmatherapy sputum is utilized in the same way. The material for inoculation is killed by chloroform. Treatment of this type in 9 cases is reported—a streptococcus arthritis, a gonococcal arthritis, a puerperal infection with abscess formation, a cystitis, a streptococcal abscess, two chronic purulent pleurisies, and two broncho-pneumonias. In a majority of the cases the results are reported as "very good" being particularly striking in the puerperal infection and the streptococcal arthritis. Treatment with such preparations is advocated since it combines specific vaccine therapy with non-specific protein therapy, and in addition involves the introduction of diastases contained in the leucocytes.—G. H. S.

1481. Erfahrungen mit "Staphar." (*Results with "Staphar."*) Ferdinand Rosenberger. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1358–1359.

Strubell's "staphar" is a vaccine produced by the treatment of staphylococci so that the lipoid content is increased while the toxicity of the protein fraction is reduced. The vaccine has proven very effective in furunculosis. Its usefulness in pyodermias seems great.—B. C.

NONSPECIFIC THERAPY

(*See also Numbers 1388, 1407*)

1482. Ueber unspezifische Immunisierung bei Krankheiten mit unbekanntem Erreger. (*Nonspecific Immunization in Diseases of Unknown Origin.*) Ernst Friedrich Müller. München med. Wchnschr., 1920, **67**, 1349–1350.

Successful experiments upon the hoof and mouth disease of cattle. A study of the clinical features of the disease led to the conclusion that there was a rapid destruction of the normal defenses of the body with consequent damaging invasion by secondary invaders. It was found that "protoplasmic activation" by means of intramuscular introduction of bacteria— and toxin-free milk-protein solution produced an increase in the body defenses, evidenced especially by the cellular reaction in the bone marrow. The experiment was performed on a large scale (3000 head of cattle) by veterinarians during an epidemic, and the results were favorable.—B. C.

1483. Intravenöse Injektion von Elektroferrol zur Bildung von unspezifischen Abwehrstoffen. (*Intravenous Injection of Colloidal Iron for the Formation of Nonspecific Protective Substances.*) Heinz. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1438.

Intravenous injection of colloidal iron after subsidence of an acute febrile disease is claimed to stimulate the production of cellular and possibly humoral defenses against secondary infection.—B. C.

1484. Behandlung der Grippe mit Diphtherieserum und der Grippepneumonie mit Trypaflavin. (The Treatment of Influenza with Diphtheria Serum and of Influenzal Pneumonia with Trypaflavin.) Max Crohn. München. med. Wchnschr., 1920, 67, 1521–1522.

Antidiphtheritic serum, 3000 units subcutaneously, was administered in 15 uncomplicated cases of influenza with high fever. The results were distinctly favorable. Trypaflavin, intravenously administered, was effective in controlling influenzal pneumonia.—B. C.

1485. Ueber die Behandlung mit nichtspezifischen Pflanzen-Eiweiss. (Treatment with Non-specific Plant Protein.) A. S. Horovitz and E. Zueblin. Schweiz. med. Wchnschr., 1921, No. 2, 34–36.

Antivirulins derived from plants induce a mild general reaction and accomplish a neutralization of bacterial virulins. Neutralization of these products of bacterial activity permits phagocytosis to an increased degree.—G. H. S.

1486. Serologische Untersuchungen über Caseosan. (Serological Studies on Caseosan.) Rudolf Salomon. München. med. Wchnschr., 1920, 67, 1499–1500.

Complement fixation tests were performed upom men and animals injected intravenously with caseosan (a milk-protein preparation). The reaction was definitely positive in the majority of cases.—B. C.

EXPERIMENTAL INFECTIONS

(See also Number 1314)

1487. Essais de transmission expérimentale de la rougeole au lapin. Constatation d'un érythème sur la peau rasée. (Attempt to Transmit Measles Experimentally to the Rabbit. Demonstration of an Erythema upon the Shaved Skin.) Compt. rend. Soc. de biol., Par., 1921, **84**, 968.

The intravenous injection of rabbits with 1 to 2 cc. of the blood of cases of measles caused a cutaneous reaction to occur which is considered specific. The blood was taken on the first day of the eruption. Within 48 hours of the time of the injection a non-papular, non-hemorrhagic, erythema developed upon the shaved skin of the rabbit. This reaction persisted for 24 to 48 hours and then faded gradually. Scarlatinal and normal bloods failed to induce this type of reaction.—G. H. S.

1488. Similitude des lésions produites chez le lapin par les différents types de Salmonella humaines. (Similarity of Lesions Produced in the Rabbit by the Different Types of Human Salmonella.) Besson and de Lavergne. Compt. rend. Soc. de biol., Par., 1921, **84**, 810–811.

Eighteen hour cultures of *B. paratyphosus* B, *B. aertrycke*, bacillus of Gärtner, *B. castellani*, and *B. morgani* of uniform concentration were heated at 70°C. for 50 minutes, held in the ice-box for 3 to 4 days, and then injected in 3 cc. amounts intravenously into rabbits. Profuse diarrhea developed about 3 hours after the injections and the animals died within 10 to 24 hours. The autopsy presented in all cases congestion of the mesentery, a hemorrhagic condition of the intestine, vascular dilatation in the stomach, and, in general, a hemorrhagic enteritis. Similar cultures of *B. typhosus* or of *B. dysenteriae* Hiss failed to kill the rabbits or to produce the enteric lesions.—G. H. S.

CHEMOTHERAPY

(See also Numbers 1309, 1317, 1318, 1319, 1348, 1355, 1358, 1408, 1420, 1422, 1483)

1489. Zur Experimentellen Chemotherapie der Typhuzbazillenträger und der Gallenblaseninfektionen. (The Experimental Chemotherapy of Typhoid Carriers and of Gall Bladder Infections.) P. Uhlenhuth and Th. Messerschmidt. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1293–1295.

Rabbits were made chronic typhoid carriers by the injection of typhoid cultures directly into the gall-bladder. The usual internal disinfectants failed to affect the carrier state. Numerous dyes were tried. The silver, mercury and copper salts of fluorescein and safranin were not effective *in vivo*. Methyl violet and fuchsin, intravenously or intramuscularly injected were found to stain the bile and the upper intestinal tract. Methyl violet from 3 manufacturers was tried upon 22 rabbit typhoid carriers, and 14 were cured, while 10 control animals remained unchanged. Spontaneous cure occurred only in 3 per cent of several hundred animals observed. The disinfecting property seems to follow the double bond in the triphenylmethane dyes. Diphenylmethane dyes, like auramine, are more toxic and less bactericidal, and furthermore are not excreted with the bile. Dyes of the fluorescent series are excreted by way of the kidneys and therefore useless for the present purpose. Trypan red, trypan blue and congorubin A are said to stain the liver intravitally but were not tried in these experiments. Brilliant green and malachite green are less bactericidal than methyl violet and fuchsin. The latter are, however, somewhat tonic and produce necrosis at the site of injection. Their leuco-bases are less toxic, but the bactericidal property is absent.—B. C.

1490. Zur Technik der Silbersalvarsaninjektion. (The Technic of Silversalvarsan Injection.) W. Pirig. Berl. klin. Wchnschr., 1920, 57, 1167–1170.

The method is described in detail.—B. C.

MISCELLANEOUS

1491. *Zur röntgenoskopischen Diagnose eitriger Prozesse unterhalb des Zwerchfelles (subphrenischer, paranephritischer, Leberabszess).* (*The X-ray Diagnosis of Suppurations below the Diaphragm. Subphrenic, Paranephritic and Hepatic Abscesses.*) ERNST LYON. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1303–1304.

Four cases of suppuration below the diaphragm confirm the importance of röntgenoscopic examination in the diagnosis of such abscesses. The method is however only an aid in diagnosis and no more.—B. C.

1492. *Ueber den Rezidivbegriff.* (*The Concept of Disease Recurrence.*) H. OELLER. München. med. Wchnschr., 1920, **67**, 1487–1491.

In various infectious diseases clinical observation has established that: (1) there are differences only in quantity, not in kind, of the disease defenses in mild and acute exacerbations; (2) the total biological reaction (sickness) of macroorganism against the invader is a sum of continuous and periodically consecutive single reactions. A general biological law is assumed which is apparently valid mainly in infections by microbes that do not at once paralyze the defenses of the human body with definite toxin secretion. Analyses of temperature curves in typical cases support these views of the clinician. No attempt is made at an interpretation of the phenomena from an immunological standpoint.—B. C.

1493. *Die Verbesserung der Insuffizienz der Selbstschutzvorrichtungen im Gewebe.* (*The Improvement of Tissue Defenses.*) A. TEILHABER. Wien. klin. Wchnschr., 1920, **33**, 1071.

The body is protected from internal and external disease dangers first by the round cells and secondly by the tissue cells. Reduction in their number and quality paralyzes the body defenses against many diseases. These observations are extended to include not only infections and degenerative diseases but also cancer. Improvement in the defense may be facilitated by increasing the round cells and connective tissue cells by means of venesection and diathermia.—B. C.

1494. *Extraction de ferments cellulaires.* (*Extraction of Cellular Ferments.*) R. TURRO. Compt. rend. Soc. de biol., Par., 1921, **84**, 435–437.

Extraction of pancreas, thyroid, liver, and kidney tissues yielded ferments possessing hydrolytic properties and bactericidal action for *B. anthracis* and other organisms. Extracts of the different tissues appear to exert a somewhat selective action quantitatively upon different bacterial species. These ferments are common to all tissues and it is unnecessary to assume specialized ferments derived exclusively from the polymorphonuclear cells for the digestion of bacteria.—G. H. S.

1495. *Natur und Entstehung diastatischer Fermente.* (*Nature and Origin of Diastatic Enzymes.*) W. BIEDERMANN. München. med. Wchnschr., 1920, **67**, 1429–143[illegible]

NaCl and phosphates are necessary complements to the activity of ptyalin upon amylose. Ashed saliva has the property of digesting amylose, though very slowly. This observation is taken as proof that the enzyme may be formed from the substrate.—B. C.

1496. *Recherches sur la cholestérine.* (*Research upon Cholesterin.*) A. MARIE. Compt. rend. Soc. de biol., Par., 1921, **84**, 920–921.

The following observation may be of some significance in connection with the effect of cholesterinemia upon certain infectious conditions. Rabbits injected intravenously with cholesterin acquire, within 20 hours, serum agglutinins for *B. typhosus*. The agglutinating property of the serum is lost by heating at 60°C.—G. H. S.

The Subject Index for Volume IV will be published in an early issue

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ABSTRACTS

OF

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UNDER THE EDITORIAL DIRECTION OF THE
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EDITOR
A. PARKER HITCHENS

It is characteristic of Science and Progress that they continually open new fields to our vision.—PASTEUR

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BIBLIOGRAPHIC REVIEW

1497. THE BACTERIOLOGICAL ASPECTS OF CHEESE RIPENING

G. J. HUCKER

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The ripening of cheese has long presented an interesting, though complex problem. Chemists and bacteriologists alike have been unable to advance an acceptable explanation of the phenomena involved. This fact has stimulated the interest of many investigators in the field of dairy bacteriology and dairy chemistry.

The changes produced during the ripening stages of cheese are neither wholly bacteriological nor wholly chemical. Acceptable conclusions have been reached only by correlating the results of both lines of investigation. This review of the literature deals with the bacteriological aspects of the problem; papers which discuss chemical investigations are not included unless they have a direct bearing upon the bacteriological side of the question. The omission of so important a phase of cheese ripening does not signify that the biological changes are more important but expresses rather the feeling of the writer that chemical work should be covered by one more conversant with the chemistry of casein compounds and their appearance during the ripening process.

It is impossible to abstract, in a brief review, all the papers that have appeared upon this subject. In making the selection, only those have been included which are the basis for the more important theories and contentions that have been current at various periods. (See bibliography for complete list.)

HARD RENNET CHEESE[1]

Bacteria ripened. (*Cheddar, Emmental.*) The ripening of a cooked rennet cheese involves two distinct, yet closely related phenomena. The first of these consists chemically of the gradual transformation or splitting of the insoluble casein of the milk until nearly all of it has been converted into simpler, soluble and digestible products. The other factor—and this distinguishes a ripened from a green cheese—is the development of flavor. The flavor does not develop as rapidly as do the chemical changes in the casein, and its appearance seems to depend upon the presence of a certain amount of these soluble proteins. Though beginning later it progresses rapidly and the two processes develop simultaneously in the later stages of the ripening.

At first investigators in approaching the problem of cheese ripening gave undue weight to one or the other of these processes. Duclaux, Adametz, Weigmann and their followers believed that if the cause of the development of flavor could be established the general problem of cheese ripening would be solved. They based the results of their experiments upon the development of flavor and the physical appearance of the cheese, and estimated the solubility of the cheese, in the late ripening stages, by the ability of an emulsion of it to pass through a porcelain filter; this method proved later to be unreliable. Freudenreich, Jensen and other investigators of their group regarded the changes in cheese ripening as centered around the breaking down of the insoluble proteins and the ability of the bacteria involved to attack these substances either in milk cultures or in the cheese. Both groups of investigators later appreciated the fact that normal cheese ripening involves both processes and that neither process alone could produce a normally cured cheese.

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[1] Only cheese made with rennet need be considered as the sour milk varieties rarely undergo a ripening process.

Prior to 1878, the changes involved and the causes of the ripening of cheese had not been studied as a distinct problem. Cohn, 1872, (1–2) mentions the possibility that organisms which produce butyric acid play a part in ripening cheese but submits this thought only as a conjecture and offers no experimental data to support this conclusion. Duclaux, a student of Pasteur, in 1878–80 (3–4–6–7–10) was the first investigator to make a careful study of this particular problem and to attack it as an individual line of investigation. Duclaux being a native of Cantal was naturally familiar with Cantal cheese, a hard rennet variety. His purpose was not only to determine the factor which caused the ripening changes but to place cheese manufacture upon a scientific basis and so help the local cheese makers out of many difficulties. The technic which he developed included dilution of an emulsion of cheese in milk until he obtained a practically pure culture of the predominating organisms; this in turn, was inoculated into sterile milk and incubated. In general, he followed the technique of Pasteur, in use at the time, for isolating pure cultures. The inoculated milk cultures of Duclaux, when examined microscopically, in a majority of the cases, yielded heavy rods of various sizes to which he gave the name "Tyrothrix." These organisms when grown in pure culture in milk had a decided cheese odor and had the power of attacking casein, both points tending to substantiate his claims that these liquefying organisms (probably spore-forming) played the principal rôle in the ripening processes. The production of a cheese odor in the experimental cultures gave rise to the idea that cheese ripening was identical with the development of flavor and aroma. Although later, these conclusions were disproved many times, it must be remembered that the present methods and apparatus were not available at that time; it was much easier to observe the large rods in the microscopic preparations of Duclaux's time, than a small lactic organism or micrococcus. Whatever mistaken conclusions he drew, it should not be forgotten that Duclaux first connected the ripening of cheese with microorganisms and opened this interesting field of bacteriological research.

Not until 1887 was the cheese ripening problem again taken up, this time by Benecke (9). After a few general observations he suggested that the ripening might be due to an unorganized ferment which could be demonstrated by making cheese under bacteria-free conditions. Adametz (11) in 1889 followed the suggestion of Benecke and made cheese, excluding bacteria by the use of kreolin, thymol, etc. He found that under such conditions the characteristic flavors did not develop, and so concluded that he had definitely settled the relationship between enzymes and cheese ripening; a conclusion which remained unchallenged for a number of years. He (Adametz) then turned his attention to bacterial action in cheese and, having the advantage of solid, liquefiable media, found that cheese in its ripening stages contained large numbers of rod shaped organisms, a majority of which produced acid from the sugars. With this investigation, originated the so-called "lactic acid" theory of cheese ripening. Adametz in an endeavor to correlate his results with those of Duclaux, concluded that the group of organisms which he (Adametz) had studied were capable of forming acid and of secreting a peptonizing enzyme. Of the Tyrothrix group which he isolated he decided that one species was largely responsible for the ripening changes and named it *B. nobilis*. Later he prepared pure culture starters of this species for commercial use in making Emmental cheese.

The reports of Adametz were followed by a series of papers by Freudenreich, who enlarged upon the lactic acid theory, basing his conclusions upon the fact that a large number of "lactic acid" organisms were found in the ripening Emmental cheese. He also noted that cheese made from pure culture starters was superior in quality to that which had been manufactured from starters containing cultures of the peptonizing bacteria (Tyrothrix). In his initial paper (13) he called attention to the fact that lactose fermenting organisms were the predominating types and outlined the possibilities of their function in cheese ripening. While Freudenreich worked with Emmental cheese and demonstrated large numbers of acid producing types, Lloyd, 1891 (18) found the same condition in English cheddar and reported that "*Bacillus acidi lactici,*" was the predominating type in this variety of cheese. Although submitting experimental data to substantiate his results, he does not definitely conclude that the changes in ripening are due to this group but presents such a conclusion as an assumption, supported by the number of lactic acid organisms present, and the suggestive results obtained from making a limited number of cheeses with pure culture starters.

Freudenreich, 1891–5, in continuing his studies submitted a series of articles (17–20–25–34) to further strengthen his contention that the lactic group was entirely responsible and offered, as additional proof, several analyses of cheeses of various ages and the results obtained from other cheeses made from pure culture starters. That the same lactic group was present in American cheddar cheese and predominated at least in the early stages was determined a year later by Russell and Weinzirl (39–40) who attributed to this group an important part in the ripening of cheddar cheese. The problem of cheese ripening attracted the attention of Weigmann, who with his co-workers, did not accept Freudenreich's views, but revived the contention of Duclaux that cheese ripening was due to organisms which actively attacked the casein of the cheese. In a series of papers (42–56–71–170) which appeared from 1896 to 1906, Weigmann outlined several objections to the lactic acid theory, one being that Freudenreich had not used virulent cultures in his pure starter experiments. Weigmann also contended that only degenerate types of lactic organisms had been isolated and that because they were degenerate, their action was not characteristic. Weigmann admitted that the lactic organisms were present but would attribute to them no other function than that similar to a catalytic agent, in enhancing the action and growth of the liquefying and spore-forming types. He contended that Freudenreich in presenting his results obtained with lactic acid starters, lost sight of the fact that although this group was present in the ripening cheese they did not necessarily function but only remained dormant, and that the Tyrothrix types, although present in small numbers, produced the desired changes. Weigmann stated that the quality of the cheese was directly dependent upon the bacterial flora of the milk, a point which has been emphasized throughout the work on cheese ripening.

During 1896–7–8, Freudenreich (45–53–54–59–60–61–72–73) replied to the arguments of Weigmann and presented evidence to strengthen his position. In answer to Weigmann's assertion that the "degenerate types" of lactic bacteria which he had isolated would not attack the casein and render it soluble, Freudenreich presented the results of several chemical analyses of cheese (Emmental) made from sterilized milk with pure cultures of the lactic acid group added, and proved that the total soluble nitrogen in the cheese increased as the ripening stages progressed. As a check on this work he inoculated a series of milk cultures with the same bacteria and added $CaCO_3$ to neutralize the acid formed. After incubation for a given length of time, chemical analysis revealed a large amount of soluble nitrogen. Freudenreich attributed this fact entirely to the organisms as no other factors were present. He also brought up the fact that Weigmann had not worked with Emmental, but with a somewhat differently ripened cheese (Cantal), that he had not offered many data to sustantiate his claim regarding the longer ripened rennet cheeses (Emmental, etc.), and that peptonizing bacteria did not function to a large extent in ripening Emmental cheese. In support of the latter statement he gives records of cheese made from pure cultures of Tyrothrix, which show that the Tyrothrix organisms gradually disappear during the ripening stages until in the latter periods comparatively few could be found. Cheese manufactured from mixed cultures (Tyrothrix and the lactic acid organisms) presented a similar picture, Tyrothrix being gradually replaced by the lactic acid group.

In the meantime, the biological phases of cheese ripening were taken up in the United States at the Wisconsin Agricultural Experiment Station and at the New York Agricultural Experiment Station. At the Wisconsin Station, Babcock and Russell in 1897 (48–70–77) announced that milk contained a natural enzyme which they later called "galactase." This enzyme is a natural milk ferment with the power to digest protein and is independent of the bacterial flora, a fact which was demonstrated by its action in milk to which a given amount of an antiseptic such as toluol, chloroform, etc., had been added. Cheese made from such treated milk was found to advance quickly through the ripening stages and to develop large amounts of soluble nitrogen, due to the action of galactase. This theory attracted wide attention both in the United States and abroad and was immediately studied by Freudenreich and Jensen at Liebefeld, Switzerland. Freudenreich (90–98) could not believe that a natural enzyme played the principal rôle in the ripening, he still holding to the lactic acid theory, but admitted that the natural rennet might play an important part in rendering the casein available for the lactic acid bacteria and in facilitating their action. He based his statements on the results of a series of experimental cheeses made from bacteria-free milk and bacteria-free rennet and also cheese made from artificial rennet with various lactic cultures added. He found in all cases that the cheeses which were subjected to the combined action of the natural enzymes and the lactic organisms were superior. The objection was later made that the heat which he used to sterilize the milk in all of his experimental cheese might affect the results. Jensen (83) in working with the same problem of natural enzymes in cheese ripening corroborated the results of Babcock, Russell and Freudenreich, using Limburger as a representative type of the soft cheeses and Emmental as a type of the hard variety. In the case of the Limburger he found the casein to be attacked by the natural enzymes in the earlier stages. Later, the surface was attacked by molds and bacteria which imparted the characteristic flavors. In the Emmental cheese he found the changes taking place more or less evenly through the mass and attributed the breaking down of the casein to the natural enzymes. During this work he discovered simultaneously with Babcock, Russell and Vivian (81) in 1900, that the rennet added during the making process contributed a possible ripening factor in the form of pepsin which remained in the cheese and also played an important part in the subsequent changes of ripening, a factor which heretofore had been overlooked.

Klecki in 1896 (43–44) did not enter the argument with other investigators but attributed the development of flavor and the other changes in the ripening to organisms which form butyric acid in the cheese thus developing the idea suggested by Cohn in 1872 (1–2). Freudenreich (115) made several cheeses which had been inoculated with pure cultures of various anaerobes but found that such cultures would not live and reproduce in the cheese. Rodella (127–128) later contended that Freudenreich did not inoculate the cheese properly. In his work Rodella used a special brand of cheese which may have affected his results with the anaerobe starters. In the main, the theory that anaerobic activity produces the principal changes in cheese ripening, has been discredited. However, the propionic fermentation in the production of normal holes in Emmental cheese, which Freudenreich (165–166) later discovered, is caused by a facultative anaerobe.

Leichmann and Bagerewski, 1900, (84) fearing that the term "lactic acid bacteria" had become ambiguous studied the cultural and morphological characteristics of a number of lactose fermenting organisms isolated from Emmental cheese. Their suggested classification arranged the organisms into four groups as follows: *Bacterium casei I; Bacterium casei II; Bacterium casei III; and Bacterium casei IV.* These organisms were rods of various sizes which attacked lactose with the formation of acid resulting in a smooth curd. Occasional gas holes were developed in the curd by some cultures. The isolation and identification of the groups from ripened cheese tended to put the whole problem on a more logical basis and served to clear away many erroneous ideas which had grown up regarding the work of Freudenreich.

Working with Edam cheese in 1905 (75–147–148–169), Boekhout and deVries offered the suggestion that although the lactic acid organisms may be the principal factors in the ripening, certain groups and combinations of these types tended to give better results than others. They also contended that the ripening took place in scattered centers throughout the cheese mass and in their later work fostered the idea that the centers of ripening were not due to the action of lactic bacteria but to the action of enzymes elaborated by bacteria, probably of the types which Duclaux and Weigmann had previously described.

During the period from 1898 to 1905, Freudenreich and his coworkers continually strengthened their arguments in favor of the lactic acid group as the chief factor in the ripening. Freudenreich had found from his experience that the solution of the problem did not depend upon the development of the flavor in the cheese nor upon the digestion of the insoluble compounds, but rather upon the results of both of these phenomena. In connection with Emmental cheese, Freudenreich also had in mind the question of the development of the normal gas holes, characteristic of this cheese, an additional problem in this particular variety of cheese.

Freudenreich realized that more work had to be done on the general characteristics and classification of the lactic bacteria, other than *Bact. lactis acidi*, before their definite relationships with cheese ripening could be established, so in 1904 (134) he reported an extended study on this particular group outlining their cultural characteristics and placing them in four groups as follows: *Bact. casei* α; *Bact. casei* γ; *Bact. casei* δ; *Bact. casei* ε. He again started various experiments using different strains of these groups in an endeavor to connect the ripening phenomena with some particular variety of the group. In later work he concluded that *Bact. casei* ε played an important part, due to the fact that it was capable of breaking down casein into amino acids but could not produce such products from the albuminoses or peptones. From this observation he concluded that some other group of bacteria was working in symbiotic relationship with *Bact. casei* ε and producing proteolytic enzymes and that the combined action of the two factors caused the changes in the ripening stages. He also studied a group of liquefying cocci (103) which he had previously isolated from Emmental cheese, to obtain information regarding the development of flavor. He found that while this group could live and reproduce in small experimental cheese they soon died in large Emmental cheese. This he explained as follows: "*Il semble que la temperature elevé qui regne dans les grands fromage d'Emmental encore longtemps après leur preparation, et le degre d'acidite qui augmente très vite, sont des obstacles au development des coques liquificants.*" Freudenreich then advocated the use of a pure culture of *Bact. casei* ε for cheese-making (Emmental) until 1906 when working with Jensen he isolated the organism responsible for the propionic acid fermentation which plays such an important part in the development of normal "eyes."

More recent work on this point has been completed by Sherman (242) who has used a medium of different H-ion concentration than that used by Freudenreich and Jensen, and has succeeded in isolating an organism similiar in its cultural characteristics and also in its effect upon the ripened cheese.

After Freudenreich's death Jensen continued the work at the Liebefeld station (Switzerland), but laid more emphasis on the chemical aspects of the question, so that only a part of his work is within the confines of this review. He contributed several valuable papers on the relationships of the enzymes to the fatty acids and their affect upon the flavor of cheese.

Gorini (140) working with Grana cheese, found that an acid liquefying coccus similar to the one used by Freudenreich was responsible for the ripening of this particular variety of cheese. The flavor in this case he thought to be produced chiefly by the lactic acid group and a liquefying acid producing group. The latter were either of coccus or rod forms but the coccus types were the more important in the ripening phenomena. In later work Gorini, however, conceded that although the liquefying coccus group might play a part in the ripening of Grana, its rôle in the ripening of Emmental was not important.

Troili-Peterson (117) succeeded in making microscopical preparations of Swedish "Güterkäse" and demonstrated the organisms as they actually existed in the cheese mass and also their relationship to the formation of the normal "eyes." Gorini (139), Rodella (156), used a similiar technic in examining cheese to study the distribution of the flora. Harrison (162), Percival (213) and Hucker (241) have also embedded and sectioned cheese in studying the ripening of various kinds of cheese.

In the United States during the last twenty years studies upon bacterial activity in the ripening of hard cheese have been actively pursued at the New York Agricultural Experiment Station, the Wisconsin Agricultural Experiment Station and the United States Department of Agriculture, while in Canada cheese ripening problems have been investigated by Harrison at Macdonald College.

At the New York Station, Van Slyke and his co-workers (Hart, Bosworth, Smith) had previously contributed valuable information on the chemistry of the casein compounds and also upon the relation of the fat content of milk to the yield of cheese, both of which stand as important advances in the cheese investigational work. In 1901 Harding began his work on the biological phases of the problem and in a report with Van Slyke and Hart (94–125) discussed the action of enzymes in cheese. At this time the enzymes in cheese were supposed to be of three sources; bacterial, pepsin from the rennet extract, and the natural ferments from the milk. The bacterial group of enzymes had first been called to attention by the work of Duclaux, Adametz and Weigmann. Babcock and Russell had first demonstrated natural enzymes, while the Wisconsin group with Jensen were the first to mention pepsin as a factor. In the earlier work at the New York Station it was found that cheese subjected to chloroform or other antiseptics to check the bacterial action failed to develop the characteristic flavors or odors, although the casein was broken down and large quantities of soluble nitrogen were found. Harding and Van Slyke (173) then developed a method by which chloroform was added to milk cultures in those proportions which checked the bacterial growth of the organisms permitting the enzymatic action to be readily studied. This was an advance over Freudenreich's method of heating the milk to stop bacterial action as such a procedure not only checked the action of the organisms but destroyed the inherent enzymes of the milk. Finding that bacterial action played an important part in the development of flavors, Harding and Prucha in 1908 (175) made an extensive survey of the flora of cheddar cheese. They found that *Bact. lactis acidi* was the predominating type of organism in cheddar cheese, thus substantiating in part Harding's conclusion in 1903 (119) that the lactic organisms were the principal types in cheese and that they were important in the ripening, especially in the earlier stages, in that they suppressed other forms and facilitated the action of the rennet by breaking down the sugars into acids.

Much of the work at the Wisconsin Station has been in conjunction with the United States Department of Agriculture. Hastings and Hart from Wisconsin and Miss Evans from the Department of Agriculture in 1912 (202) studied the general factors involved in the ripening processes. They concluded that *Bact. lactis acidi* was the predominating type in the early stages but that it was replaced after the sugar had been converted into acid, by the *Bact. casei* group which utilized other sources of carbon. Cocci were also found in large numbers. In 1914 Hart, Flint and Evans (216) in studying the physiological activities of the organisms isolated from American cheddar cheese found that the cocci were able to produce in milk cultures large amounts of volatile fatty acids "probably from citric acid, lactose or protein, as the medium was practically free from fat." It was also concluded that as the cocci are present in large numbers in cheese they produce much of the volatile fatty acids which arise during the ripening process. They also showed that the *Bacterium casei* group produced large amounts of acetic and also of lactic acid (both active and racemic) and could decompose citric acid when available.

One of these strains of streptococcus was found to produce large amounts of alcohols and esters—"bodies which contributed in a large degree to the flavors of cheese."

These results are significant when the results of Suzuki, Hastings, and Hart (191) are considered. They found that flavor production was due to the development of the volatile fatty acids but did not discuss their origin.

At Washington in 1904, Rogers (143) published an outline of the work previously completed on the subject and presented data from ripening cheese at low and high temperatures to prove that the development of bacteria and bacterial enzymes are responsible for the production of flavor. He ripened two lots of cheese, one series at a high temperature (23°C.) and another at a lower temperature (8°C. to 12°C.), and noted the differences in the ripening. The bacteria in the cheese cured at high temperature decreased rapidly and the cheese developed an over-ripe flavor early in the curing process, and the increase in the amides and ammonia continued after the bacteria had nearly disappeared. In the cheese ripened at the lower temperatures the organisms decreased very slowly until only a few remained. "Bacterial enzymes were formed at an earlier period and in greater quantity in the high temperature cheese than those ripened at low temperatures." Miss Evans in Washington has given her chief attention to the types of bacteria in the cheese and their relation to the flavor. In 1914 (219) she published an article on the flora of American cheddar cheese and corroborated the findings at Wisconsin that the *Bacterium lactis acidi* group is replaced in the later stages of the ripening by the *Bact. casei* group and a large number of cocci and a few streptococci. Her results showed that certain strains of the *Bact. casei* group are largely responsible for the pungent flavor, while particular groups of *Bacterium lactis acidi* contribute to the characteristic flavor of cheddar cheese. Of the cocci isolated, the streptococci were thought to contribute to the flavor production, if present in large numbers, while the micrococcus group imparted a distinct "bitter" taste. She was successful in producing cheese with a characteristic flavor when a mixed starter was added to pasteurized milk, which contained a particular group of *Bacterium lactis acidi* and a streptococcus. (*Bact. casei* group always developed in pasteurized milk cheese and was not included in the starter.) Later, in 1918, she made a careful study of the streptococci involved and found that they were able to improve the flavor of pasteurized milk-cream cheese and could modify significantly the flavor of pasteurized milk cheese in general.

Harrison and Connell at Macdonald College (Canada) (92–102–113–114–141) in studying the flora of cheddar cheese and its relation to the ripening thought the lacto-bacilli were the most important group and investigated the members of this group and the lactic acid group in the various stages of manufacture and ripening. The lacto-bacilli were found to be the predominant types in the later stages and the development of desirable flavors was in distinct proportion to the number of these organisms present.

Burri (136–182–185–231–237) at the Liebefeld Station in Switzerland has worked in recent years with the lacto-bacilli and their relation to the ripening changes in Emmental cheese. In his investigations he has concluded that *Bact. casei δ* Freudenreich plays the principal rôle in the ripening.

As it stands today the investigations have clearly demonstrated that the breaking down of the insoluble casein compounds is due to enzymes, either natural or bacterial, while characteristic flavors are produced by the action of certain groups of bacteria (*Bact. casei* or coccus group) which depend upon the products of *B. lactis acidi* present in large numbers during the manufacture and early ripening stages.

Mold ripened. (*Roquefort, Gorgonzola, etc.*) The ripening of cheese of this type has been studied chiefly in the United States by Thom at the Connecticut (Storrs) Experiment Station. Thom and Currie found (210–225–226) that the predominating mold in Roquefort cheese was *Penecilium roqueforti* while of the bacteria present, *Bact. lactis acidi* was found in large numbers. A few strains of *B. bulgaricus*, some liquefying organisms and yeasts in small numbers were observed but no significance was attached to their presence. The flora of the surface slime varied and played no part in the subsequent ripening processes. The lactic group was thought to produce sufficient acid in the early stages to suppress the growth of gas-p oducing types, and enzymes elaborated by the molds produced the characteristic changes in the later stages. In examination of Stilton, Gorgonzola and Brindeze, Thom found the Roquefort mold to be the dominant type present.

Daire (217) refers to spores of *P. roqueforti* as the cause of the "green marbling" of Roquefort, Gex, Sessanage, Mont Cenis, Septmoncel, Gorgonzola, Stilton, etc.

Steuart (239) found the Roquefort mold in Roquefort, Gorgonzola, Stilton, Blue Caerphilly, while in Wenslydale and a few samples of Stilton, and Blue Caerphilly other types were present.

Miss Evans, in 1918 (235), in an extended research on the flora of Roquefort cheese concluded that the organisms present fell into four groups, viz., *Streptococcus lacticus* and *P. roqueforti*, which were the most numerous, and *B. bulgaricus* and streptococci, which were not abundant.

SOFT RENNET CHEESE

Uncured. A group of the soft rennet cheeses, Neufchatel, cream, etc., are marketed without curing and the bacterial action which takes place has not been studied in relation to the changes, if any, in the flavor and consistency of the cheese.

Cured. (Camembert, Brie, etc.) Baier (49) believed that mold ripened soft cheese derived its initial inoculation from the milk and that certain groups of these molds present in the proper proportions would cause the development of desirable characters in the ripened product. This heterogeneous flora was obtained by a partial sterilization of the milk at given temperatures which killed all but the desired types. He found that by subjecting different samples of milk to this procedure, he obtained milk with nearly a constant and similar flora and with this flora he succeeded in making the best grades of cheese.

Johan-Olsen (58) working with "Gammelost" (a Norwegian cheese) found that the samples coming under his observation contained the following flora: lactic acid organisms, *Chlamydomucor casei*, *Mucor casei I*, *P. aromaticum casei*. By changing the flora of the starters used he could vary the quality of the cheese at will, when the above organisms were present.

Epstein (108), in 1902, at Prague studied the ripening of Camembert and Brie cheeses and attributed the changes in the curd of Brie to the action of *P. album*, but denies the participation of molds in the ripening of Camembert.

Marpmann studied a long series of fungi as isolated from this group of cheese, while Constantin and Ray (62) described the appearance of certain molds upon Brie cheese. The above work was incomplete in most cases and the descriptions of the organisms so inadequate that later observers have found it difficult to definitely identify these particular molds.

In connection with his work with Roquefort, Thom (151–152–153–163) worked with Camembert cheese at the Connecticut (Storrs) Agricultural Experiment Station. From his work he concluded that the principal ripening factors were the lactic acid group of bacteria which furnished the necessary amount of acid upon which the *P. camemberti* mold acted, while attacking the casein and producing the desired texture. The characteristic flavor is developed by the white mold, *Oïdium lactis*.

In examining other varieties of this class of cheese, Thom found *Oïdium lactis* upon Limburger, Brie and d'Isigny.

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* Includes all types of "lactic acid bacteria."

ABSTRACTS OF BACTERIOLOGICAL LITERATURE

HISTORY, BIOGRAPHY, LITERATURE

1498. William Thompson Sedgwick, 1855–1921. J. Bact., Balt. 1921, **6**, 255–262.

An obituary, written by Professor Winslow, following the death of Professor Sedgwick on January 25, 1921, in Boston. The notice is accompanied by an excellent full-page portrait of the deceased.—I. S. F.

CHARACTERIZATION AND CLASSIFICATION

(See also Number 1507)

1499. The Main Lines of the Natural Bacterial System. S. Orla-Jensen. J. Bact., Balt., 1921, **6**, 263–273.

This paper contains a discussion of Dr. Jensen's criticisms of the report of the Committee of the Society of American Bacteriologists (Winslow, et al., J. Bact., Balt., 1920, **6**, 191) and the recommendations which he believes should receive further consideration at the hands of systematists. The text does not lend itself to abstraction here.—I. S. F.

1500. Bacilles encapsulès et indol, Artichaut et rouge neutre. (Indol Production by Encapsulated Bacilli, and their Growth upon Artichoke and Neutral Red Media.) S. Marbais. Compt. rend. Soc. de biol., Par., 1921, **85**, 48–49.

Eighteen strains of encapsulated bacilli secured from various normal and pathologic conditions were compared with typical *B. coli*. All strains, including *B. coli*, produced the green pigmentation in the artichoke medium; although the depth of color produced varied somewhat with the different strains. The encapsulated forms could not be differentiated from *B. coli* in their reactions upon a neutral red agar or a neutral red agar containing glucose. The encapsulated forms failed to form indol.—G. H. S.

1501. Culture des Bacilles encapsulés dans l'urine humaine normale, chauffée à 120, et additionnée de leucocytes. (The Cultivation of Encapsulated Bacilli in Normal Urine, in Urine Heated to 20° and in Urine Containing Leucocytes.) S. Marbias. Compt. rend. Soc. de biol., Par., 1921, **85**, 133–134.

Further work upon "reversible" and "irreversible" encapsulated bacilli of the *B. Friedländer-B. lactis aerogenes* group is reported. Cultivated in a normal heated human urine the encapsulated bacilli produce an abundant turbidity; but when planted in a urine which has not been heated no turbidity results. From the latter, after incubation for some days, it is impossible to recover viable organisms. With the heated urine subcultures are readily secured. The pneumobacillus, even after 30 daily transplants in heated urine is capable of fermenting dulcite. It thus appears that the pneumobacillus, as well as *B. lactis aerogenes*, can be adapted to urine without losing its peculiar property of attacking dulcite; consequently the encapsulated forms found in pathologic urines, and which fail to act upon dulcite form an independent species. Furthermore, an unheated normal urine will not permit the growth of those encapsulated forms which are to be found in pathologic urines. If pus, from a cold abscess, is added to an unheated urine all forms of the encapsulated bacilli grow. With the one group, the ability, with the other, the inability to ferment dulcite is not modified by growth under such conditions. In such a urine-leucocyte culture *B. Friedländer* is dead after 23 days, the other group is not.—G. H. S.

1502. Further Studies in Diphtheroids. Fifth Paper. Ralph R. Mellon. J. Med. Research, Bost., 1921, **42**, 111–126.

This study with pure cultures started from single cells was undertaken to meet the criticism of earlier work by the author. The results of the earlier study were confirmed, and the conclusion is drawn that it is possible to transform pure cultures of diphtheroids, isolated from the single bacterial cell, to diplococci which during the process have acquired new characters that are essentially those of streptococci.—A. C. E.

NEW SPECIES

(See also Number 1558)

1503. Bacillus irreversus capsulatus. S. Marbais. Compt. rend. Soc. de biol., Par., 1921, **85**, 93–94.

It has been shown that encapsulated bacilli of the type of *B. Friedländer* show a reversible reaction when cultivated upon an agar containing litmus and a sugar. The acid reaction given in this medium by *B. lactis aerogenes* never undergoes a further change. This latter statement does not harmonise with the findings of Grimbert, the reason being that the authors have given the name *B. lactis aerogenes* to two different species of bacteria. The true *B. lactis aerogenes* of Escherich gives a reversible reaction. Other organisms related to these were studied, among them a encapsulated bacillus isolated from the urine of a case of cystitis and prostatitis. This organism is characterised: non-motile, Gram-negative, grows readily in broth and peptone water with a surface ring; and produces heavy capsules when recovered from the blood and peritoneal cavity. The colonies on fresh agar resemble those of the pneumobacillus; colonies upon a dry agar are flat and discrete. Both types of colonies give indol production in peptone water. They give the green pigmentation on artichoke medium, and reduce neutral red. They ferment galactose, glucose, glycerine, levulose, maltose, mannite, and xylose. Dulcite, inulin, lactose, and saccharose are not fermented. Milk is not coagulated. They are pathogenic for mice, killing them on the fifth day. The organism appears to be a new species and is named by the author *Bacillus irreversus capsulatus*.—G. H. S.

BACTERIAL NUTRITION AND METABOLISM

(*See also Number 1597*)

1504. *The Nature of Toxin. The Antigens of Corynebacterium diphtheriae and Bacillus megatherium and their Relation to Toxin.* C. C. Warden, J. T. Connell and L. E. Holly. J. Bact., Balt., 1921, 6, 101–124.

Following procedures described in this and in previous papers of Warden and his colleagues, the fatty acid complex of *C. diptheriae* was found to consist of approximately 80 per cent unsaturated acids and 20 per cent saturated, non-volatile acids. The same complexes, in two-thirds the concentration were found in toxin filtrates of cultures. There were prepared several artificial complexes of fatty acids having nearly the same chemical characteristics as those isolated from the bacteria and these were tested against the sera of animals immunized against *C. diphthdriae* and against diphtheria toxin. Complement fixation tests demonstrated strong parallelism in the behaviors of the artificial antigen and control diphtheria germ suspensions. (The authors do not agree with Besson (*Pract. Bact.*, 1913, 269) that animals immunized with toxin show no immune bodies in their sera.) Inasmuch as diphtheria toxin arouses the production of specific antitoxin, the authors incline to the opinion that the toxin is diphtheria antigen from the bodies of disintegrated bacilli and that toxin is the specific fat complex. The method of preparing the fat complex appreciably influences its antigenic value. Filtration of the artificial antigen through a Berkefeld filter greatly decreases its toxicity for subcutaneously inoculated guinea pigs. The proper emulsification or colloidal dispersion of antigen in the broth is a *sine qua non* of its antigenic nature. Considerable irregularity in the killing time of the artificial toxin was noted. The pathological pictures at autopsy were considered in a measure specific for diphtheria toxin.

Working on the assumption that the fat antigen in broth is an emulsion colloid, the authors attempted to obtain preparations of greater stability by the addition of emulsifying agents such as hemoglobin, casein, egg albumen, gelatin and typhoid protein. The first of these proteins was found to be particularly valuable. The color of the broth which is used in antigen preparations is apparently concerned with the state of the dispersed colloid phase and markedly influences the antigenic value of the solutions. It was also found that a maturation period of at least one hour at 20°C. after the mixing of the ingredients is essential to the development of maximum hemolytic and toxic powers of artificial antigens. The preparations are thermolabile like true hemolysins and toxins. Diphtheria antitoxin protects guinea pigs against the artificial fat-complex diphtheria toxin.

Two strains of *B. magatherium* were studied. The fat complex considered to be characteristic for this organism was 56 per cent oleic and 44 per cent capric acid. Complement fixation and precipitation tests showed this artificial antigen to behave like *B. magatherium* antigen. Animals inoculated with artificial *B. megatherium* antigen showed in their sera specific agglutinating and complement-fixing bodies and strong antilysins. Experiments with this organism indicate that hemolysin and toxin are probably the same substance.

The specific chemical nature of an antigen together with its colloidal state are considered as two independent and primary characteristics. The immune and serological phenomena are conceived of as adsorption processes whose qualitative as well as quantitative dynamics are controlled by the above-mentioned characteristics of antigen, i.e. the large surface area of the dispersed colloid induces the absorption because the colloid, being fatty, lowers surface tension and therefore produces concentration of solute at interphases, and the chemical nature of the collid determines the qualitatives of the absorption.

"The injection of unorganized particulate surface (kaolin, charcoal) leads to absorptions and induced toxicity of the plasma of the animal (anaphylaxis); injections of, or infection by, bacteria or other cells also produce absorptions, but the character of the substances absorbed must be different for each species of cell, depending on the chemical complex constituting its surface.

"The result of such absorptions on the body fluids is a deprivation of some of their constituents, followed by the fluids compensating, or making good their loss by an attack upon certain groups of body cells which may contain the missing substances upon their surfaces. There is considerable evidence pointing to the fact that toxins and antigens need not act directly on the cells but through the medium of the fluids bathing them. The substances primarly absorbed, when regained gradually and in excess from the cells we regard as specific antibody."

The authors do not place much credence in the rôle of *lipoids* in these immunological processes and even question whether such substances actually exist in tissues. "Aside from colloidal or emulsifying activity cellular protein appears to have no place in the immune reactions studied."—I. S. F.

1505. Chemical Criteria of Anaerobiosis with Special Reference to Methylene Blue. IVAN C. HALL. J. Bact., Balt., 1921, **6**, 1–42.

The paper reviews at considerable length the chemical criteria of anaerobiosis, and particularly the literature on the use of methylene blue. There is good reason to believe with the author that this reagent lends itself very readily to satisfactory manipulation in work with anaerobic bacteria. The mechanism and chemistry of decolorisation of methylene blue are discussed in detail and experiments on the conditions necessary for decolorization are described. Quantitative studies indicate that the weaker the concentration of dye, the less alkali is required for decolorization. It appears that the amount of alkali required for decolorization bears an inverse relation to that of glucose (the reducing agent used) but the necessary amounts of these two reagents bears a direct relation to that of methylene blue. The more alkali present, the less glucose is required, and *vice versa*, but the more methylene blue, the more glucose or alkali is needed. No exact determinations of hydrogen ion concentrations were made.

With respect to the maintenance of decolorization of decolorized methylene blue it appears that temperature, light, alkalinity, viscosity of the medium and other factors beside oxygen tension are factors of importance.

The author points out a certain correspondence between reduction of Fehling's solution and the decolorization of methylene blue in alkaline solutions of various carbohydrates.

A number of experiments are described on the decolorizing power of certain plant and animal tissues, of certain tissue extracts and of certain porous substances. The importance of the phenomenon of dye absorption is given considerable weight here.

The chemical criteria of anaerobiosis which were studied by the author were correlated with the biological criteria of anaerobic growth. With respect to the latter, recourse was had to such obligate anaerobes as *B. welchii*, *B. tetani*, *B. botulinus*, etc.

The efficacy of deep culture methods for obtaining the maintaining an aerobic conditions was demonstrated. The inefficacy of oil seals is clearly contrasted with the efficacy of certain mechanical seals and with the reliability of semi-solid waxes and greases.

The shortcoming of methylene blue as a criterion of anaerobiosis for bacteriologic work in that for the present its usefulness as an index *in* culture fluids is limited to alkaline media is given causal recognition. Obviously this does not apply to its use as an indicator of anaerobiosis in the atmosphere about or in fluids near the test fluids. The author recognizes the great need for accurate data on the relation of exact oxygen tensions to the production and maintenance of methylene blue decolorization.—I. S. F.

1506. Solid Culture Media with a Wide Range of Hydrogen or Hydroxyl Ion Concentration. FREDERICK A. WOLF AND I. V. SHUNK. J. Bact., Balt., 1921, **6**, 325–330.

The authors demonstrate that agar or gelatin media may be made to jellify at pH limits far beyond any which microorganisms can tolerate if they are cooled before being rendered acidic or alkaline. The media may be manipulated so as to avoid contamination when the reaction is being adjusted and they need no subsequent sterilisation.—I. S. F.

1507. Variations in Typhoid Bacilli. KAN-ICHIRO MORISCHIMA. J. Bact., Balt., 1921, **6**, 275–323.

The paper presents an extensive investigation on certain phases of the carbohydrate metabolism of typhoid variants and on variations in agglutinability of *Bact. typhosum*. The primary problem is the determination of whether these variations are indicative of true mutations or merely of species variations. The phenomenon of "daughter colony" formation on solid sugar medium with its absence on the plain solid medium is considered to indicate utilisation of the carbohydrate. Simpler sugar utilization, even without the production of acid or gas, should fall under the title "fermentation." Observation of "daughter colony" formation is supposed to give good results on sugar utilization particularly with those cultures which give unsatisfactory results in sugar broths.

Wide variations in sugar fermentations were observed when the periods of observation were extended over several weeks. So long as they are not grown in xylose media those cultures which only slowly ferment xylose ("slow fermenters") retain this characteristic even for years. By cultivation on xylose media they could be trained to produce acid xylose broth in 24 hours like typical typhoid bacilli. The power of utilising xylose was considered to have been latent in these cultures, and hence they should be considered as variants rather than mutants.

All of the strains studied gave rise to daughter colonies on rhamnose agar, but none produced acid in rhamnose broth. Neither daughter colonies nor acid were produced with raffinose. The author agrees with Krumwiede and with Jordan in the use of acid production from rhamnose for the differentiation of typhoid from paratyphoid bacilli.

Typhoid bacilli grown upon normal serum do not become inagglutinable; cultivated upon specific immune serum they at first become inagglutinable, but become agglutinable after persistent cultivation. The return to normal agglutinability may be long delayed. Inagglutinability is accompanied by inability to absorb agglutinin. The author's experiments do not indicate that capsular material is concerned with the inagglutinability. The inagglutinable strains showed abnormal acid agglutination reactions, behaving like *Bact. coli* rather than *Bact. typhosum* in this respect. For these and other reasons the author considers that changes observed here and by others should be regarded as variations and not as mutations and that the word mutant had better not be introduced extensively into bacteriological literature.—I. S. F.

1508. Growth Requirements of Influenza Bacilli. T. M. Rivers and A. K. Poole. Johns Hopkins Hosp. Bull., Balt., 1921, **32**, 202–204.

Rivers and Poole conclude that the phenomenon of augmented growth of influenza bacilli on solid media in the vicinity of other bacteria may be due to any one or, at times, all of the following factors:

"(a) The removal of inhibiting substances that are marked in certain bloods, as human and hen's blood.

"(b) The change of the hydrogen-ion concentration to one more favorable for the growth of influenza bacilli.

"(c) The alteration in the blood, making growth substances more available.

"(d) The production by the symbiotic bacteria of an autoclave labile substance necessary for the growth of influenza bacilli."

The authors have found that two substances are necessary for the growth of influenza bacilli, both of which are present in blood. One of these withstands autoclaving at 15 pounds pressure for half an hour and has never been found outside of blood. The other essential substance is autoclave labile and has been obtained from yeast as well as blood. Just how these promote the growth of *B. influenzae* is unknown.—F. W. H.

1509. Studies on Azotobacter chroococum Beij. Augusto Bonazzi. J. Bact., Balt., 1921, **6**, 331–369.

Experimental evidence presented in this paper indicates that the carbon metabolism of Azotobacter is considerably influenced by the available sources of combined nitrogen. The treatment of either the carbon or nitrogen metabolism alone is injudicious. The existence of an apparently constant $CO_2:O_2$ ratio (± 1.0) is indicated to be misleading and is not borne out by more careful studies of glucose consumption. It appears that the carbohydrate is quickly utilized by Azotobacter in the early stages of incubation and that this preliminary sugar utilization—the nature of which is not clear—is stimulated by the presence of inorganic nitrates. The "ferment power" (i.e. ratio of sugar utilized to number of cells) is high when nitrate disappearance is rapid. The author considers that his data indicates that nitrates perform a function in the sugar metabolism very much like that played by the phosphate-sugar complexes in yeast fermentations. The preliminary stage in the utilization of sugar may be associated with the formation of a sugar-nitrate complex. In the second or maintenance phase, such complexes appear to be reworked, partially burned, partially utilized in the building of cellular substance and partially secreted in the surrounding medium in the form of soluble by-products. During this phase the nitrogen is actually assimilated, directly contrary to the belief of Hills. (J. Agric. Research, 1918, 12, 183–230). "A *loss* of nitrogen appears to take place during the first phase, a loss which, if slight, may be again made up in the second phase of development." The author inclines to the conclusion that Azotobacter rather than serving as an active gatherer of free nitrogen acts to immobilize nitrate nitrogen, taking the upper hand over the denitrifiers.—I. S. F.

1510. Die Nitrosoindolreaktion. (*The Nitroso-Indol Reaction.*) J. Groenwege. Ext. du Bull. du Jardin Botan de Buitenzorg. Ser. II. Vol, 2. Fasc. 3, 1020, p. 315-345.

The author prefers the title "nitroso indol" to that of "cholera red" reaction, because a number of other vibrios give the reaction when cultivated in peptone water.

The above reaction is explained by the presence, in the peptone water, of nitrates which are reduced to nitrites. It is almost impossible to demonstrate the presence of nitrates in peptone or bouillon by chemical reagents, but it may be done biologically. A denitrifying bacterium inoculated in the peptone water will reduce the nitrate and nitrite to gaseous nitrogen; when inoculated, after sterilization, with *Vibrio cholerae*, no nitroso-indol reaction is obtained.

This reaction can now be used as a sensitive test for nitrates by preparing a stock of sterile nitrate-free solution of peptone medium and adding the material to be tested as the need arises. The substance to be tested for nitrates should contain no nitrite and no substances toxic to microörganisms and should be sterile. (Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., Ref., 1921. **53**, 319–320).—S. A. W.

1511. Über Darmbakterien. II. Züchtung des B. bifidus auf Hämatinnährböden. (*Intestinal Bacteria. II. Cultivation of B. bifidus upon a Hematin Medium.*) A. Adam. Ztschr. f. Kinderh., Berl., 1921, **29**, 65–67.

An attempt was made to discover a more satisfactory method of isolating *B. bifidus* from stools. The addition of various carbohydrates, neutral fats, and variations in the pH of the medium were without result. Fractions of human red blood cells, and serum, were added to a 1 per cent lactose bouillon containing pieces of coke. In this medium a satisfactory growth was secured. The medium with the washed red cells was most favorable particularly if the medium was heated to 100°C. for 2 to 3 minutes. A medium was later developed whereby the blood was treated with $\frac{N}{1}$ NaOh and the alkali hematin thus formed was added to the medium.—G. H. S.

THE D'HERELLE PHENOMENON-BACTERIOPHAGE

1512. De l'action destructive des sels de quinine sur le bactériophage de d'Herelle. (*Destructive Effect of Quinine Salts upon the Bacteriophage of d'Herelle.*) G. ELIAVA AND E. POZERSKI. Compt. rend. Soc. de biol., Par., 1921, **85**, 139–141.

Destruction of the *B. dysenteriae* Shiga bacteriophage by the salts of quinine is reported. Phenol and sodium fluoride, in the concentrations used did not impair the activity of the bacteriophage.—G. H. S.

BACTERIOLOGICAL TECHNIC

(*See also Numbers 1580, 1581*)

1513. Methods of Close Automatic Control of Incubating Temperatures in Laboratories. JOHN T. BOWEN. U. S. Dept. Agric., Bulletin 951, 1921.

The construction of an incubator room, 7 feet wide, 7 feet 6 inches deep by 8 feet 5 inches high, is described in detail with drawings. A plan of the air-circulatory system, a wiring diagram of the temperature-control system is also shown with a detailed description. The temperature is maintained very accurately. The cost for electric energy at 6 cents per kilowatt hour averages 50 cents a day of 24 hours.—S. H. A.

1514. Demonstration of Capsule-like Appearance in Staining Gonococci. CLARA ISREALI. J. Am. M. Ass., Chicago, 1921, **76**, 1497.

A staining method is described which brings out a capsule-like zone around gonococci. —P. G. H.

1515. Régulateur a fléau bimétallique pour thermostata a chauffage électrique. (*Bimetallic Bar Regulator for Electrically Heated Thermostats.*) EDOUARD CHATTON. Compt. rend. Soc. de biol., Par., 1921, **85**, 116–118.

The details of construction are explained and illustrated.—G. H. S.

1516. Dispositif simple pour la distillation d'épreuve des cultures bactériologiques. (*Apparatus for the Distillation of Bacteriologic Cultures.*) RHEIN. Compt. rend. Soc. de biol., Par., 1921, **85**, 126–128.

The construction of the distillation apparatus, which can be readily prepared from materials on hand in any laboratory, is illustrated and described. It is particularly adapted to the determination of such substances as may be produced by bacterial growth, as, for example, phenols, indol, alcohol, acetone, volatile fatty acids, and ammoniacal products.— G. H. S.

MYCOLOGY

(*See Numbers 1526, 1588*)

SOIL BACTERIOLOGY

(*See also Number 1509*)

1517. Untersuchungen über die Zersetzung der Zellulose durch aërobe Bacterien. (*Experiments on the Decomposition of Cellulose by Aerobic Bacteria.*) J. GROENEWEGE. Extr. du Bull. du Jardin. Botan. de Buitenzorg. 1920. Ser. iv, **2**, Fasc. 3 ,261–314. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1921, **53**, 144–418.

The author has made a detailed study of the decomposition of cellulose in the soil by aerobic bacteria. By a symbiotic action of two groups of bacteria, a rapid decomposition of cellulose was accompanied by a rapid denitrification: one group decomposed the cellulose, while the other reduced the nitrate, this reduction was made possible by the products of the decomposition of cellulose by the first group.

By cultivating the organisms on solid media, the author obtained pure cultures of *Bact. opalescens* and *Bact. viscosum* belonging to the first group and *Bact. cella-resolvens* α, β and γ belonging to the second group of bacteria. A symbotic relationship for cellulose decomposition and dentrification existed between representatives of each of the two groups.—S. A. W.

1518. A Bacteriological Analysis and Cultural Test of "Nitro-bacter Soil Vaccine." D. H. JONES. Scientific Agric., Gardenvale, P. Q., 1921, **1**, 266–267.

Bacteriological tests of a commercial preparation indicating that it is not what it is claimed to be. The vegetative tests are still incomplete, but appear unfavorable.—H. J. C.

1519. *Nodule Bacteria of Leguminous Plants.* F. Löhnis and R. Hansen. Scientific Agric., Gardenvale, P. Q., 1921, **1**, 257–264.

This paper has been already noted from another source; see Abstract No. 353.—H. J. C.

1520. *The Gases of Swamp Rice Soils. V. A. Methane-Oxidizing Bacterium from Rice Soils.* P. A. Subramania Aiyer. Mem. Dept. Agric. Calcutta, 1920, India Chem. Ser. **5**, No. 7, 173–180.

The writer isolates from rice soils an organism capable of oxidizing methane and utilizing it as a source of carbon while growing on mineral media. Its isolation is accomplished by planting in a mineral, silicate-jelly medium. Upon subsequent cultivation on organic media the cultures isolated were found to grow vigorously but to have lost their power of oxidizing methane. They did not recover this lost power. Upon study these cultures all proved to be a fluorescent denitrifier, which the writer calls *B. fluorescens liquefaciens*, thinking it to be identical with the organism described by others under this name. Although the cultures after once growing on organic media never recovered the power of oxidizing methane, the writer claims that his cultures were pure because his findings were constant.—H. J. C.

1521. *The Gases of Swamp Rice Soils. VI. Carbon Dioxide and Hydrogen in Relation to Rice Soils.* W. H. Harrison. Mem. Dept. Agric. India, Calcutta, 1920, Chem. Ser. **5**, No. 8, 181–194.

The writer points out that the gases of rice soils kept in wet cultivation contain large proportions of CH_4 and N, and comparatively small quantities of CO_2 and H, whereas practically all known bacterial fermentations produce large quantities of CO_2 and H and very little N is liberated except in the presence of nitrate. Nitrate is not present to any appreciable extent in the swamp soils.

The writer's investigation shows that in the presence of hydrogen, CO_2 is reduced by bacterial action with the formation of organic matter and marsh gas. In this reaction more H disappears than CO_2 and as more CO_2 is produced in marsh soils than H, one would expect considerably more CO_2 to be present in the gases evolved from rice soils. Such is regularly the case.

This reaction makes it possible to explain why there is so little H and CO_2 in the gases from these soils. Nor is it necessary to assume some unusual form of decomposition of organic matter whereby much nitrogen is evolved from organic matter. Inasmuch as this reaction removes the CO_2 and the H, the only gases left would be N and CH_4, and their presence in considerable quantity in the evolved gases is therefore to be expected.

The writer found this same reaction to take place when a sample of soil was used that had never been subjected to wet cultivation, so it seems likely to be characteristic of soils in general and not merely of rice soils.—H. J. C.

PLANT PATHOLOGY

1522. *Cotton Diseases and Their Control.* W. W. Gilbert. U. S. Dept. Agric., Farmers' Bulletin 1187, 1921.

Several important diseases attack the cotton crop and reduce the yield materially. The principal cotton diseases which cause damage in the Southern States are described together with the best known methods of control. The disease which causes the largest losses in the United States is known as wilt, or black-root. The control measures recommended are to use wilt-resistant varieties and rotate to reduce root knot. For root-knot rotate with immune crops. For anthracnose select disease-free seed of resistant varieties, also rotate crops. For bacterial blight, select disease free seed, also rotate crops. For rust add humus to soil, use potash fertilizers also drain wet land. For Texas root-rot plow deeply in the fall also rotate crops. Minor diseases as leaf-spot, leaf-blight, areolate mildew, true rust, Diplodia boll-rot and Fusarium boll-rot are also discussed.—S. H. A.

DAIRY BACTERIOLOGY

1523. *Report of the Annual Meeting of the American Dairy Science Association, October 11, 1920.* J. Dairy Sci., Balt., 1921, **4**, 158–182.

The reports of committees presented to this association of greatest interest to bacteriologists are those of the Committee on Milk Quality and of the Committee on Bacteriological Methods for Market Milk.

The former dealt primarily with the question of the standardization of milk and of the proper labeling to use in case standardization is permitted,

The latter included a report of the changes introduced into bacteriological technic introduced by the new Standard Methods report approved by the American Public Health Association, and discussion of the need for state legislation for the control of bacteriological analyses where used extensively as a basis of payment to farmers. A resolution favoring a state control similar to that used for butter fat testing was approved by the Association.—R. S. B.

1524. Beitrage zur Kenntnis der Bakteriziden Eigenschaften der frischermolkenen Kuhmilch. (The Bactericidal Properties of Freshly Drawn Cow's Milk.) Walter Meier. Inaug. Diss. Tech. Hochschule, Zürich, Dresden, 1919, 1–94.

In fresh milk from individual cows there was a distinct decrease at 18°-20° C. during the first 4 hours. Growth usually began in 7 hours but did not become rapid until 12 or 15 hours. The intensity of the bactericidal action varied with different cows. When the milk was held at 14° the time at which increase in numbers of bacteria began varied from 12 to 18 hours. At 30° and 37° there was sometimes a small decrease and sometimes an increase at 3 hours. There was always a distinct increase in 5 hours.

In milk obtained under aseptic conditions and containing a small number of bacteria the period of inhibition when held at 13° was extended to 36 hours or more. At 30° and 37° the increase began at 5 hours. No consistent difference was found in the bactericidal action of milk from different quarters or in different fractions from the same quarter. Part of the retardation observed at the low temperatures is believed to be due to the effect of the temperature.

That the retardation was not due entirely to temperature was shown by inoculating sterile milk in various ways and adding to different flasks varying amounts of fresh milk. The growth was much more rapid in the check flasks to which no fresh milk was added.

The bactericidal action is not equally efficient against all types of bacteria. The possible causes of the bactericidal action is discussed. Among these are some definite constituents of the milk as the lactose, leucocytes, leucocyte matter, immune bodies or amboceptors, complements, and antitoxins.—L. A. R.

1525. Report of the Bacteriological Section of the Michigan Agricultural College. Ward Giltner. 59th Ann. Rpt. State Bd. Agr. Michigan for 1920, 31 pp., 1921.

Projects under investigation are listed under the following heads: Adams fund. The effect of disease in the cow on the milk; the keeping qualities of butter; the decomposition of peat; market milk investigations; bovine infectious abortion. Hatch and State funds. A study of such animal diseases as occur in the state and come to attention through the state officials or the veterinarians and their clients; nitrogen-fixing organisms; various fermentations such as vinegar, pickle, milk, stock food and fodders; dairy sanitation; rural water supplies; bee diseases.—R. S. B.

1526. A Study of Lactose-Fermenting Yeasts Present in "Yeasty" Cream. B. W. Hammer and W. A. Cordes. Iowa Agr. Exper. Sta. (Ames), Research Bull. 61, 1920, 24 pp; Creamery & Milk Plant Month., 1921, 10, 44–45.

A report on the organisms causing one of the important fermentations in cream shipped for some distance known as the "yeasty" or "foamy" fermentation. Typical fermentations of this sort occur especially in warm weather and have a definite "yeasty" odor and show much gas formation. Forty-five cultures were isolated and studied from cream samples collected from a variety of sources. These cultures were divided into two distinct types which did not agree with previously described organisms. They were therefore named *Torula cremoris* and *Torula sphaerica*.

As these organisms were found not only in distinctly "yeasty" cream but also in many samples of cream where this characteristic was not developed these organisms are of general distribution. Because of their wide distribution it is felt that the most valuable corrective measures are those directed toward preventing growth such as cooling the cream in shipment, or toward killing the undesirable organisms in the cream such as pasteurization.—R. S. B.

1527. The Sporogenes Test as an Index of the Contamination of Milk. S. Henry Ayers and Paul W. Clemmer. U. S. Dept. Agr. Bull. 940, 1921; Creamery & Milk Plant Month., 1921, 10, 41–43.

The Savage sporogenes test is not sufficiently delicate to be of value because not enough milk is used. The Weinzirl test, using three tubes with 5, 10 and 15 cc. of milk does not appear to correlate with the quantity of manure in milk. The experiments show that the test is of most value when 10 tubes with 20 cc. of milk to each tube is used. These tubes containing the milk are heated to 80° C. for 15 minutes then each is covered with a layer of melted paraffin ¼ inch thick. After cooling, the tubes are incubated for 48 hours at 37° C. A "stormy" fermentation shows a positive test. As a rule the sporogenes test with 10 tubes and 20 cc. of milk shows high results, that is, a large number of positive tubes with milk produced under dirty conditions. With milk produced under clean conditions, the test is apt to be negative or show only a few positive tubes. The test tends to differentiate between extremes in methods of production and naturally most milk will fall between these limits. No reliance can be placed on a test with one sample of milk. The test if used should be taken as merely an indication of conditions of production and should be verified by actual inspection at the farm.—S. H. A.

1528. A Rapid Acidity Test for Grading Milk. Roscoe H. Shaw. J. Dairy Sci., Balt., 1921, 4, 91–94.

The author describes a simplified method for determining acidity of milk as received at condensaries. It is specially applicable when it is desired to determine quickly whether or not the acidity of a given lot of milk is above or below a specified standard. The method used involves dipping a given quantity of milk into a white enameled cup with a standard dipper, adding a few drops of phenolphthalein, and then adding a given quantity of standard alkali with another dipper. The solution remains pink if the acidity is less than the amount for which the solution and dippers have been standardized, colorless if the acidity is greater than this amount. Directions for standardization are given.—R. S. B.

1529. Acidity and Quality. F. W. Bouska. J. Dairy Sci., Balt., 1921, **4**, 105–113.

A discussion of the effect of the neutralization of cream in butter making in which the author reaches the following conclusion:

"Neutralization of cream reduces its acidity, makes possible pasteurization without scorched flavors and excessive losses of fat in the buttermilk, and thus improves the keeping quality of such butter. Neutralization is not a cure-all for stale cream, rancid cream, feed flavors nor any other defects that afflict cream and butter. Neutralization does not enable a creamery to make good butter out of poor cream. Poor cream always makes poor butter."—R. S. B.

1530. Counting Bacteria with a Microscope. Russell E. Frost. Hoard's Dairyman, Ft. Atkinson, 1921, **61**, 955.

A popular account of the method developed by W. D. Frost for determining the number of bacteria in milk by counting the microscopic colonies in agar on a slide. The outfit used for field work, which includes a carrying case arranged to act as an incubator, is described.—L. A. R.

1531. Hot Air Sterilization of Dairy Utensils. S. Henry Ayers and Courtland S. Mudge. J. Dairy Sci., Balt., 1921, **4**, 79–90.

A study of the effectiveness of dry heat in the sterilization of dairy utensils such as milk cans. Data are presented showing the length of time and amount of heat necessary to destroy the larger part of the bacterial flora of utensils where cans can be held for some time (as at dairy farms) and also where the process of treatment must be continuous (as at dairy plants). The temperatures used varied from 230° F. to 284° F. With a holding time of 30 minutes for the lower temperature and one of 4 to 6 minutes for the higher one, practical sterilization was obtained. The authors feel that there are possibilities of utilization of this method of treating dairy utensils which should be developed by sanitary engineers.–R. S. B.

1532. Two Organisms of a Commercial Lactic Starter. S. Henry Ayers and Courtland S. Mudge. J. Dairy Sci., Balt., 1921, **4**, 240–249.

"Two cultures of streptococci were isolated from a commercial starter. These two cultures seemed to be necessary in order to reproduce acidity and flavor of the original starter.

"One culture was evidently a strain of the *Streptococcus lacticus* group. It produced a high acidity in milk and but little volatile acidity. The other culture seemed to correspond to organisms of the *Streptococcus kefir* type. It produced but little total acidity in milk and when grown with the *Streptococcus lacticus* culture produced considerable volatile acid.

"Gas was observed in the original starter. This was undoubtedly due to the growth of the organism of the *Streptococcus kefir* type, since when grown with the *Streptococcus lacticus* culture there was gas formation similar to the original starter. It was further observed that carbon dioxide was formed by the culture when grown in peptone milk.

"Associative action between the two cultures was very noticeable. The results indicated that the *Streptococcus lacticus* type through its growth converted the nitrogenous material of the milk into a form more available for the *Streptococcus kefir* type and as a result the growth of the latter was increased.

"The results reported represent a study of only one commercial starter. It remains to be determined whether the cultures are the same in all starters."—R. S. B.

1533. Pasteurization a Safeguard with Milk from Untested Cattle. H. T. Baldwin. Am. Food J., 1921, **16**, 10–11.

Investigations on the relation of bovine to human tuberculosis have shown that the bovine type of tubercle bacillus may cause tuberculosis in man. It has also been shown that this bacillus and other pathogenic organisms which may be present in milk are killed by holding the milk at 140°F. for 30 minutes; but since the acidity of the milk and other factors have an effect on the thermal death point of these organisms, the pasteurizing temperature has been set at 145°F. for 30 minutes to make sure of their destruction.

The old method of attempting to eradicate tuberculosis by testing herds here and there at random has proven unsatisfactory and expensive. A much better plan, the author believes is the "area plan" which has been tried in New York State. By this plan the cattle within a certain area are tested as rapidly as possible, the tuberculous animals removed from herds whenever found and the premises cleaned and disinfected. No cattle are added to these herds except such as have successfully passed the tuberculin test.—E. L.

1534. Weitere Untersuchungen über die Biologie der Milchsäure-bakterien. (Further Investigations on the Biology of Lactic Acid Bacteria.) D. Constantino Gorini. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1921, **53**, 284–287.

The author summarizes the work published in detail, during 1914–1920, in Italian scientific publications. The subjects discussed are as follows: I. Proteolytic activities, under acid conditions: these are favored by lower temperatures (15–20°), by the peptonized constituents of the milk and are injured by violent sterilization of the milk. II. Resistance towards heat; the acid-lab forming cocci may not be killed even at 100°C. Rules are suggested for the improvement of the industrial sterilization of milk. III. Microflora of the udder: This led the author to suggest selection of cows, by the examination of the microflora of the udder, particularly for the nutrition of children and making of cheese. IV. Property of young bacteria to make the milk viscous. V. Spore-forming lactic acid bacteria. VI. Application of lactic acid bacteria in the cheese industry and the preparation of acid fodder (silage).—S. A. W.

1535. Beitrage zur kenntnis der bakterienanfiedlung in normalen kuheutern. (*Studies of Bacterial Colonization in Normal Cow Udders.*) T. W. Stek. Schweiz. Zentralbl. f. Milchw., 1920, No. 38–39.

A study was made of milk drawn from the udder aseptically, giving special attention to the origin and relationships of the predominating types.

The organisms which were most abundant (cocci, short rods, and in some cases the abortion bacillus) were found to have originated from definite centers or colonies in the udder. These centers of distribution were demonstrable in the glandular tissue.

Milk containing large numbers of cells in most cases contained large numbers of bacteria. This was not true in all cases.

In correlating the types found and the reaction of the milk, the author states that the organisms found varied with the change in the reaction. Certain types were in abundance when a constant acidity was maintained but a change would, in nearly all cases, affect the udder flora.—G. J. H.

1536. El Suministro de Leche Pura. (*The Production of Pure Milk.*) Blas D'Espouy. Rev. zootec., Buenos Aires, 1921, **8**, 4–5.

A short discussion of the complexity of the problem of the production of pure milk which the author believes can be solved by improved methods.—H. M.

COMPARATIVE PATHOLOGY

(*See also Numbers 1525, 1599*)

1537. Sieroprofilassi e Sieroterapia del tetano. (*Serum Prophylaxis and Serum Therapy of Tetanus.*) Plinio Carlo Bardelli. Clin. vet., Milano, 1921, **44**, 205–219.

This article contains an extensive general discussion of the use of antitetanic serum in prophylaxis and treatment of tetanus, with some special reference to its use in veterinary practice.—F. W. T.

1538. Alcuni casi di malattia di Borna. (*Some Cases of Borna Disease.*) Riccardo Cecchérelli. Clin vet., Milano, 1921, **44**, 173–179.

The author discusses in considerable detail 8 cases of Borna disease (contagious meningo-encephalitis or cerebro-spinal meningitis) occurring in horses of an artillery regiment. Seven out of the 8 horses affected were of American origin, and in the author's opinion the disease was brought into Italy from America.—F. W. T.

1539. Lymphangite épizootique accentuée, avec lésions muqueuses simulant la morve. (*A Pronounced Case of Epizootic Lymphangitis with Mucous Lesions Resembling Glanders.*) E. Texier. Rec. de méd. vét., Par., 1920, **96**, 17–23.

The case described had cutaneous lesions typical of epizootic lymphangitis. It developed nasal lesions typical of glanders. The cryptococcus of Rivolta was isolated. Intradermal malleination resulted negatively but was immediately followed by a progressive and continued regression in the lymphangitis lesions.—W. G.

1540. Note au sujet de l'étiologie de la lymphangite épizootique. (*Note in the Etiology of Epizootic Lymphangitis.*) L. Teppaz. Rec. de méd. vét., Par., 1920, **96**, 23–25.

In a previous article in 1911 the author had advanced the hypothesis that the disease was spread by insects (flies or mosquitoes). Observations made during the war seem to invalidate this hypothesis. Three cases are reported in support of the latter view.—W. G.

1541. Microfilariose du cheval en Afrique occidentale francaise. (*Microfilariasis of the Horse in French West Africa.*) E. Aldigé. Rec. de méd. vét., Par., 1920, **96**, 46–54.

A full description of the microfilaria of the horse is given. Its geographical distribution in Guinea and Senegal is tabulated. Its pathological action is discussed in 7 cases reported. Under treatment the use of orpiment, atoxyl, trypanblue, trypanred and emetine is discussed. —W. G.

1542. Sur l'infection du cheval et du mulet par Trypanosoma dimorphon. (*The Infection of the Horse and the Mule with Trypanosoma dimorphon.*) M. G. Curasson. Rec. de méd. vét., Par., 1920, **96**, 55–59.

There is given a full description of the symptoms in both horse and mule, special reference being made to edema and ophthalmia. The treatment with galyl is discussed at length and a table is included showing the results. About 50 per cent recoveries are recorded.—W. G.

1543. Cirrhosis of the Liver in the Horse. J. F. Craig and D. Kehoe. J. Comp. Path. & Therap., Edinb. & Lond., 1921, **34**, 35–47.

Some 20 cases observed in one part of Ireland showed a condition having a marked similarity to Schweinsberger disease, Dunziekte, or poisoning by ragwort. The only constant lesion observed was cirrhosis of the liver. The number of post mortems held was small. *Fasciola hepatica* or liver fluke is excluded by the evidence as a cause of the disease. Listlessness, occasional changes of appetite, condition of conjunctiva, and inability are some of the most marked symptoms. Horses, in common with other animals, seem to avoid ragwort when at pasture and do not feed on it when it is in abundance. Its presence in the hay of the affected animals is not shown. Ragwort is suspected by the authors even though they were unable to form a definite opinion that it caused the cirrhosis and the symptoms noted.—C. E. H.

1544. Maul und Klauenseuche beim Pferd. (Foot and Mouth Disease in the Horse.) H. Wildsfeuer. München. tierärztl. Wchnschr., 1921, **72**, 8–10.

Foot and mouth disease can be transmitted to horses from affected cattle. The manifestations are the same as in cloven footed animals: i.e., high fever, loss of apetite, salivation, appearance of vesicles in the mouth, swelling of the mucous membranes of the mouth and tongue, swelling of the esophageal lymph glands; rapid but pronounced vesicular (normal) respiration. The course is benign; specific treatment is not required. Soft feeds and washing the mouth with dilute acetic acid were recommended.—W. N. B.

1545. Caporit bei Behandlung der Maul- und Klauenseuche und deren Nachkrankheiten. (Caporit in the Treatment of Foot and Mouth Disease and its Sequelae.) Ertl. München. tierärztl. Wchnschr., 1921, **72**, 185–188.

A solution of caporit 1:1000 (modified Dakin solution) is used for washing the mouths of affected cattle three times daily for 5 days. Vesicles rapidly heal and appetite is restored. A 0.15 per cent solution of caporit soon destroys anthrax spores. Foot and mouth treatment with this disinfectant should be begun as soon as salivation is noticed. Abscesses are opened, cleaned and washed daily with 1:1000 caporit, and dusted with caporit powder. A 10 per cent caporit ointment was found valuable applied locally upon the udder. Hemorrhages from the rectal mucosa were noted in cattle 8–10 weeks after eradication of the disease. Since similar hemorrhage takes place in rinderpest, a relation between the two viruses is indicated.—W. N. B.

1546. Ueber Wirkungen des Ferrihydroxides im Organismus auf den Erreger der Maul- und Klauenseuche. (The Effect of Ferric Hydroxid in the Organism on the Virus of Foot and Mouth Disease.) M. Bertschy and K. Bertschy. München. tierärztl. Wchnschr., 1921, **72**, 105–108.

Iron will protect cattle against foot and mouth disease only when their drinking water is free from organic impurities and contains iron as ferric hydroxid, Fe (OH_3), which can act on the virus in the organism only when the animals receive a continuous and constant supply of ferric hydroxid, which may be natural or added to the water supply. Other compounds of iron are valueless.—W. N. B.

1547. Botulism in Cattle. Robert Graham and Herman R. Schwarze. J. Bact., Balt., 1921, **6**, 69–83.

Although *B. botulinus* has been credited with a primary rôle as the etiologic agent in outbreaks of silage poisoning among horses and mules, its relation to poisonings among cattle has not been so clear. It appears that the symptom-complex which had been viewed as possible botulism inclines more readily to chronicity among cattle than among the other domestic animals. Cattle between the ages of 6 months and 2 years are the most susceptible; the mortality may vary from 2 to 10–30 to 70 per cent; there are great variations in individual susceptibilities; and even when non-fatal the disease may be of considerable economic importance because of the failure of the animals to increase in weight, by the decrease in the milk flow in dairy cattle, and by the loss of contaminated feed.

Available evidence indicates that the feedstuffs contain the causative agent of "forage poisoning" in cattle. Examination of a sample of silage which was viewed with suspicion having apparently proven injurious to a herd of 43 cattle of all ages gave typical *B. botulinus*. The identification of the species was checked by cultural and by immunological tests with guinea pigs. Botulinus antitoxin (type B) proved efficacious in protecting guinea pigs against the *B. botulinus* isolated from the silage. An experiment on the prophylactic use of botulinus antitoxin on cattle being fed with silage suspected of contamination with *B. botulinus* proved inconclusive because the one unprotected animal as well as 43 protected animals failed to develop symptoms of illness. That the treatment did not injure the animals is taken as encouragement to the more extensive use of antitoxin injections and the continued use (instead of destruction) of silage contaminated with botulinus toxin.—I. S. F.

1548. Les injections intraveneuses de sang virulent dans l'hyperimmunisation des animaux vaccinés contre la peste bovine. (Intravenous Injections of Virulent Blood in the Hyperimmunization of Animals Vaccinated against Bovine Pest.) E. Nicolas and P. Rinjard. Compt. rend. Soc. de biol., Par., 1921, **85**, 82–85.

Six cows immunized against bovine pest received intravenous injections of virulent blood. Repeated injections were given at 3, 7, and 6-day intervals. After this last injection two of the animals reacted either during the injection or immediately following it with anaphylactic symptoms. One of the cows died, showing intense pulmonary edema and incoagulability of the blood. In continuing the injections with the other animals further reactions were secured. The reactions, anaphylactic in character, were evidently associated with the injection of fresh homologous blood.—G. H. S.

1549. La production du virus destiné à l'hyperimmunisation des Bovidés fournisseurs du sérum contre la peste bovine. (*The Production of Virus for the Hyperimmunisation of Cattle Used in the Production of Bovine Pest Serum.*) E. Nicolas and P. Rinjard. Compt. rend. Soc. de biol., Par., 1921, **85**, 166–168.

Animals at the height of the infection are bled into citrate to the extent of 3–5 liters and the blood volume of the animals is restored by the infusion of saline. This procedure is repeated daily until the animal shows a falling temperature, at which time complete exsanguination is performed. By this method 25 liters of virus (M. L. D. 0.2 cc.) can be readily secured from a single animal weighing 400 kg.—G. H. S.

1550. Erfahrungen mit der Ascolischen Präzipitinreaktion zum Nachweise des Milzbrandes (*Experiments with the Ascoli Precipitin Reaction for Diagnosis of Anthrax.*) R. Reinhardt. Monatshr. f. prakt. Tierh., Stuttg., 1920, **31**, 268–275.

In 1910 Ascoli devised the precipitin test for anthrax post mortem diagnosis. Into test tubes pipet anthrax immune serum and over the serum float the extract to be tested. A ring at the zone of contact is formed in positive cases. To prepare the extract any tissue may be used, even if decomposed. The spleen is preferred. A small piece of tissue is boiled a minute in a test tube containing physiological salt solution, immediately cooled and filtered clear through hard filter paper. Time of contact, 10 minutes. In many positive cases the ring forms at once. Cloudiness appearing after 10 minutes is read as a negative case. A comparison of precipitin tests with microscopic examinations, cultural tests and autopsies shows that the precipitin test gives correct results and is specially valuable because decomposed tissues, otherwise unsuited to diagnostic purposes, can be used, from cattle, hogs, horses and sheep.—W. N. B.

1551. Researches Regarding Epizootic Abortion of Cattle. John McFadyean. J. Comp. Path. & Therap., Edinb. & Lond., 1921, **34**, 48–64.

In a herd of 156 animals epizootic abortion was eradicated within one year from the date of the first general test. The herd consisted of 109 cows, 18 heifers in calf or recently calved and 29 younger heifers. The first general test showed 29 positive cases, at least 20 indicating present infection (as opposed to recovery). The test was positive in every animal having a history of abortion and negative in all heifers not having yet been served. In a large proportion of the cases a long persistence of the disease was indicated by the agglutination titre of the first test. This was confirmed by repeated serum tests in several of the infected cows during their isolation. Sixteen heifers were inoculated subcutaneously with live bacilli in 1911. In 1914, 14 of them as cows showed an entirely negative result or a low agglutination titre. Disease persisted in the other 2. Calves from infected cows invariably gave positive agglutination tests soon after birth but negative results or a greatly reduced titre in 6 months to a year afterward.—C. E. H.

1552. Investigations as to the Poisonous Nature of Common Sorrel (*Rumex acetosa Linn*) *for Cattle.* J. F. Craig and D. Kehoe. J. Comp. Path. & Therap., Edinb. & Lond., 1921, **34**, 27–35.

Cattle at grass are not inclined to pick up sorrel in quantity. The experiments do not support the view that the common sorrel (*Rumex acetosa* Linn) is poisonous for cattle. The experimental animals consumed it in quantities above that which would voluntarily be taken by cattle at pasture with no untoward effects. The experiments afford no evidence that the oxalates in the sorrel are sufficient in quantity to produce serious trouble in the animals.—C. E. H.

1553. The Etiology of Black Disease. Sydney Dodd. J. Comp. Path. & Therap., Edinb. & Lond., 1921, **34**, 1–27.

The disease is apparently peculiar to sheep. It is seasonal in occurrence. It is a toxemia with an acute course. Circumscribed areas of necrosis in the liver are the primary lesions. They may be one or several in number. Toxin being carried by the blood stream may cause secondary lesions. The causal organisms are confined to the liver at the time of death. The organism is one of the larger anaerobic bacilli, sporulates readily and is probably a facultative parasite.

Sheep and other animals succumb to inoculation with virulent cultures. The lesions are anatomically identical with Black disease. Primary lesions and failure to infect in feeding experiments suggest a probable carrier. Seasonal character, geography of infected paddocks, and presence of fluke disease indicate the liver fluke as the carrier. The disease is probably identical with the braxy-like disease of Victoria and Tasmania. Further investigations are deemed necessary in order to prove that the European disease is the same as that seen in Australia.—C. E. H.

1554. *Policia Sanataria Animal.* (*Animal Sanitary Policy.*) P. de la C. Mendoza. Rev. zootec., Buenos Aires, 1921, 7, 35–67.

An article discussing the matter of the sanitary policy as concerned with the animal industry is offered by the author in which he reviews the sanitary regulations of France, Italy, Belgium, Germany, England, the United States, Uruguay, Brazil, Chile, and the Argentine Republic. He considers the stock industry of Paraguay, pointing out the importance of a sanitary policy, and reviewing the sanitary convention of 1908 and the International Conference at Montevideo.—H. M.

PARASITIC DISEASES

1555. *The Comparative Toxicity of Thymol and Carvacol* (*Isothymol*). A. E. Livingston. J. Pharmacol. & Exper. Therap., Balt., 1921, 17, 261–275.

Livingston finds thymol and carvacol to be equally toxic to rabbits, to show no striking differences in their effects on paramecia, and from their effect on earthworms, to have the same relative anthelmintic values.—F. W. H.

TROPICAL DISEASES

(*See number 1541*)

PROTOZOOLOGY

1556. *Giardia* (*Lamblia*) *intestinalis. A Common Protozoan Parasite of Children.* Kenneth F. Maxcy. Johns Hopkins Hosp. Bull., Balt., 1921, 32, 166–170.

Of 89 children examined by Maxcy 14 were infested with *Giardia* and if those under one year of age, who rarely harbor this parasite, are excluded then almost 1 out of 5 children were infested.

The author does not think the finding of a large number of motile *Giardia* in a diarrheal or dysenteric stool is sufficient evidence to establish the etiologic relationship of this parasite. In rare instances the parasite may be responsible for some intestinal disturbance although this point has not been firmly established.—F. W. H.

1557. *Sur la transmission expérimentale du Leptomonas pyrrhocoris Z. chez des insectes divers.* (*Experimental Transmission of Leptomonas pyrrhocoris Z. to Different Insects.*) G. Zotta. Compt. rend. Soc. de biol., Par., 1921, 85, 135–137.

Leptomonas pyrrhocoris Z., a normal parasite of *Pyrrhocoris apterus*, was successfully implanted into the body cavity of a number of insects; *Hemiptera, Coleoptera, Diptera, Lepidoptera*. The ability to transmit the parasite to insects is not a general phenomena, for *Carausius morosus* could not be infected.—G. H. S.

1558. *Sur les transformations du caryosome chez les Grégarines* (*a propos d'une nouvelle espèce: Gregarina mrázeki*). (*Transformations of the Karyosome in Gregarines. A New Species, Gregarina mrázeki.*) Borivoje Dim. Milojevic. Compt. rend. Soc. de biol., Par., 1921, 85, 91–92.

The karyosome of the Gregarine has not only a trophic, but also a generative function. The new species, *Gregarina mrázeki*, was found in the intestinal tract of *Ephestia kühniella* (caterpillar).—G. H. S.

EPIDEMIOLOGY

1559. *The Prevention of Diphtheria.* Wm. H. Park. N. York State J. M., N. Y., 1921, 21, 158–164.

Park first considers the effect of the use of cultures for the isolation and release of cases of diphtheria and of the use of antitoxin upon the morbidity and mortality of diphtheria and follows this with a discussion of the Schick reaction—its application, interpretation, practical value, permanence of negative reaction in persons developing natural immunity—and of the question whether diphtheria ever occurs in persons giving a negative Schick test. The author then describes toxin-antitoxin immunization and briefly analyzes the results obtained by this procedure.—F. W. H.

1560. *Contamination of the Hands and other Objects in the Spread of Contagious Diseases.* William J. Matousek. J. Am. M. Ass., Chicago, 1921, 76, 1490.

The pathogenic bacteria in the secretions of diphtheria and scarlet fever may be cultivated from the surroundings of the patients. Eating utensils also serve as carriers. Washing the hands with soap and warm water removes these secretions. The skin and nails must be in proper condition to yield to this treatment. Nurses can be protected by the use of gauze masks. The care attendants take of their person can be checked by making cultures from their hands.—P. G. H.

CARRIERS OF INFECTION

(*See Number 1585*)

DISINFECTION AND GROWTH INHIBITION

(*See Number 1599*)

WATER AND SEWAGE BACTERIOLOGY

1561. Wasserreinigung mittels Kalk im Zusammenhang mit der Trinkwasserfrage in Niederl. Indien. (Water Purification by means of Lime in Connection with the Question of Drinking Water in the Dutch East Indies.) JAN SMIT. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt, 1921, **53**, 273–284.

It is pointed out that by means of quicklime followed by filtration through a sand column 80 cm. high, a clear filtrate is obtained even from dirty water. The bacterial numbers of this filtrate are very small with a strongly marked reduction in numbers of *B. coli*. *V. cholerae* and *B. typhosus* are entirely eliminated. The action of the quicklime, due to its high alkalinity, is much more marked than that of alum. The alkaline water is then neutralized by a small amount of carbon dioxide or by thorough aeration.—S. A. W.

FOOD BACTERIOLOGY

(*See also Numbers 1525, 1616*)

1562. Studies on Botulinus. I. Destruction of Botulinus Toxin by Heat. PAUL F. ORR. J. Med. Research, Bost., 1921, **42**, 127–136.

A determination of the rate of destruction of the toxins produced by 10 different strains was made. The wide variation in resistance towards heat as shown by the different strains was unrelated to their potency. The toxin produced by one strain (Nevin) was found to be much more resistant than any of the other toxins. There was no apparent correlation between the resistance of the toxins and their type, as determined by toxin-antitoxin tests.

All the toxins were found to be comparatively thermolabile. At 80° C. they were destroyed within from 30 seconds to 5 minutes, at 72°C. within 2 to 18 minutes and at 65°C. within 10 to 85 minutes.

The average temperature coefficient of the destruction of the toxin on increasing the temperature from 65° to 72°C. was found to be 5.2. On increasing the temperature from 72° to 80°C. the average temperature coefficient was 4.2.—A. C. E.

1563. Heat Penetration in Canning with Reference to Microbial Spoilage. ZAE N. WYANT. Canner, 1921, **52**, 27–31.

This article gives a review of the experimental work of a number of investigators in regard to the microbial spoilage of canned food products, special attention being given to the matter of heat penetration in its relation to various foods. The possibilities of spore destruction is discussed with special reference to *B. botulinus*. The influence of salt, acids and sugar on the sterilization process is also considered.—E. L.

1564. Le formol dans la conservation des viandes. (Formalin in the Preservation of Food.) H. SIMONNET. Rec. de méd. vét., Par., 1920, **96**, 63–85.

The article is of a general nature andc ontains an extensive bibliography of 39 titles. The subject is discussed under: Action of formalin, its penetrating power and its persistence in the muscles, and its action on the digestibility of food with many tables showing its effect on the enzymes of digestion. It is concluded that in dilutions of 1–5000 or 1–10,000, at the limit of its harmfulness, it has feeble antiseptic properties.—W. G.

DIATHETIC AND DEFICIENCY DISEASES

1565. Studies on Experimental Rickets. III. A Pathological Condition Bearing Fundamental Resemblance to Rickets of the Human Being Resulting from Diets Low in Phosphorus and Fat Soluble A. The Phosphate Ion in its Prevention. P. G. SHIPLEY, E. A. PARK, E. V. MCCOLLUM AND NINA SIMONDS. Johns Hopkins Hosp. Bull., Balt., 1921, **32**, 160–166.

The authors report on two sets of experiments: one in which the diets contained protein in sufficient quantity and of good quality but were deficient in fat soluble A and also in the phosphate ion, the other in which fat soluble A alone was lacking. In each instance a complete description of the pathological changes produced in the skeleton is given, accompanied by microphotographs.

The two diets deficient in both fat soluble A and the phosphate ion produced in the majority of the young rats changes in the skeleton fundamentally resembling, but not identical with rickets in the human being; the chief difference consisted in the presence of scattered or irregular deposits of calcium salts in the cartilage and metaphysis. In these rats the pathologic change presented a marked resemblance to the picture seen in rachitic children in whose bones incomplete healing has taken place.

The diets lacking in fat soluble A alone resulted in no changes of a rachitic nature.

Though the authors consider the experiments to be not sufficiently numerous or comprehensive to permit of generalisations as to the effects of these deficiencies in the diet, their implication is plain. The phosphate ion in the diet may be a determining influence for or against the development of rickets. If the phosphate ion is present in adequate amount a deficiency of fat soluble A cannot cause rickets-like changes in the skeleton. An insufficient quantity of fat soluble A alone cannot be the sole cause of rickets. Conversely, there must be a deficiency in the phosphorus content of the diet, all other factors, except fat soluble A, being optimal for rickets-like conditions to develop. The development of xerophthalimia in the rat is not prevented by the addition of the phosphate ion, so it would seem proper to infer that xerophthalmia and rickets do not have an identical etiology.

The authors believe the results of these experiments do not exclude fat soluble A from consideration as a factor in the production of rickets and kindred diseases, since the level of the blood phosphates is, in all probability, determined in part by the amount of the fat soluble A available for the needs of the organism.—F. W. H.

CANCER RESEARCH

1566. Relation of Differentiation and Lymphocytic Infiltration to Postoperative Longevity in Gastric Carcinoma. Wm. Carpenter MacCarty and Arthur E. Mahle. J. Lab. & Clin. M., St. Louis, 1921, 6, 473–480.

About 9 years ago MacCarty studied the relation of regional lymphatic glandular involvement to postoperative longevity in gastric carcinoma, classifying his specimens in the following manner: Group I, specimens with no glandular involvement; Group II, specimens with some glandular involvement; and Group III, specimens with all of the glands involved. In this investigation he found, in general, the length of postoperative life to be in inverse relation to the degree of glandular involvement, but to this rule there were a number exceptions.

Of the factors which might contribute to longevity in these exceptional cases MacCarty and Mahle have studied two; viz., differentiation of the carcinoma cells and lymphocytic infiltration. The following is the authors' summary:

"1. The average length of postoperative life is 7.5 per cent greater in cases with differentiation than in those without differentiation.

"2. There is a much greater percentage of cases in Group I without differentiation.

"3. There is a much greater percentage of cases in Group III with differentiation.

"4. The greatest frequency of cases with no differentiation occurs in cases between 29 and 40 years of age.

"5. The greatest frequency of cases with the greatest amount of differentiation occurs in cases between 40 and 50 years of age.

"6. The average length of postoperative life is greatest in cases without glandular involvement plus lymphocytic infiltration.

"7. The cases without glandular involvement but with lymphocytic infiltration live 124 per cent longer than those without lymphocytic infiltration.

"8. Cases with glandular involvement lived 146 per cent longer when there was lymphocytic infiltration than did those with no infiltration.

"9. The highest percentage of cases, without lymphocytic infiltration, were those with no glandular involvement.

"10. The highest percentage of cases, with lymphocytic infiltration, were those with glandular involvement.

"11. The highest percentage of cases with marked lymphocytic infiltration occurred between 60 and 72 years of age and 40 and 50 years of age.

"12. The highest percentage of cases with no lymphocytic infiltration occurred between 50 and 60 years of age.

"13. The average length of postoperative life in cases with differentiation and lymphocytic infiltration combined is 82 per cent greater than that without differentiation and lymphocytic infiltration combined."—F. W.H.

1567. Di un caso di sarcoma delle linfoghiandole mesenteriche con metastase al fegato in una cogna. (A Case of Sarcoma of the Mesenteric Lymph Glands with Metastases to the Liver in a Bitch.) Cataldo Colella. Clin. vet., Milano, 1921, 44, 138–154.

The author discusses in considerable detail the clinical history, pathological anatomy and pathological histology of a neoplasm which he describes as a blastoma with a structure placing it among the polymorphocellular sarcomata.—F. W. T.

1568. The Origin of Cancer. A. Paine. Lancet, Lond., 1920, 2, 693.

Cancer is not the result of a parasite, but of disordered epithelial growth following physical or chemical irritation. The final outcome of this initial process is, that those parts of the cell which preside over function yield to those which are concerned with growth.—W. H. W.

1569. Note on a Case of Fibroma in a Honey-bee. P. B. White. J. Path. & Bacteriol., 1921, 24, 138.

A thoracic mass is described, which may have been a fibroma, possibly of neural origin. It was probably derived from the connective tissue of the ganglia or nerves.—W. H. W.

1570. *The Effect of Combined Radiation and Heat on Neoplasms.* G. L. Rohdenburg and F. Prime. Arch. Surg., 1921, **2.**

By combining radiation and diathermy, the usefulness of radiotherapeutics may be extended.—W. H. W.

1571. *Geschwülste bei Tieren.* (*Tumors in Animals.*) A. F. Fölger. Lubarsch and Ostertag, 1917, **182**, 372.

Review of etiology, the relation between tumor and host, and the occurrence of tumors in animals. Bibliography.—W. H. W.

1572. *Tissue Resistance in Malignant Disease.* W. Boyd. Surg., Gynec. & Obst., 1921, **32**, 306.

Three cases of widely metastasizing carcinoma or melanosarcoma are described. In the patient with carcinoma, the bone metastases spontaneously disappeared and there took place a great improvement in the general condition. The two with melanosarcoma were in perfect health for 3 and 6 years, respectively, except for the presence of a tumor ordinarily regarded as malignant to the highest degree. It is concluded that the body is not entirely defenseless against malignant neoplasms, but is able in a few cases to develop a partial resistance. This reaction is sufficiently pronounced, in very rare instances, to destroy a tumor and bring about recovery.—W. H. W.

1573. *Experimental Production of Tar Cancer in White Mice.* J. Fibiger and F. Bang. Kgl. Danske Videnskabernes Selskab: Biol. Med., 1921, **3**, 4.

In 22 out of 30 mice which survived for 103 to 333 days, carcinoma developed at the site of irritation; in 2 there appeared a carcinosarcoma. Metastases were found in the lungs and regional nodes in some of the mice, and three of the growths proved to be transplantable. One of the three was a carcinosarcoma and, as so often happens, the sarcomatous portion overgrew the carcinomatous.—W. H. W.

1574. *Inoculations of Sarcomatous Tumors into Oriental Negro Fowls.* Y. Kon and T. Fujii. Gann, Ergebn. d. Krebsforsch. in Japan, Tokyo, 1920, **14**, 21.

The authors took advantage of the abundant supply of an easily identified element (the chromatophore), to investigate the influence of two transplantable fowl tumors on normal cells. A chondrosarcoma exerted no effect on the chromatophore, but a myxosarcoma incited this element to malignant growth.—W. H. W.

1575. *On the Resistance of Chondroma Cells of the Chicken against Heat.* T. Takamori. Gann, Ergebn. d. Krebsforsch. in Japan, Tokyo, 1920, **14**, 24.

These have the same resistance as the cells of other warm-blooded animals, being able to stand a 5 minutes' exposure to 55°C. but unable to survive a temperature of 60° for the same length of time.—W. H. W.

1576. *Reports of the Results of Dietetic Experiments of Various Kinds of Fat on Birds. II. The Dietetic Effects of Lanolin on the Transplantation and Multiplication of the Transplantable Chicken Fibroma.* N. Akamatsu. Gann, Ergebn. d. Krebsforsch. in Japan, Tokyo, 1920, **14**, 27.

Lanolin causes an increase in the size of tumors after it has been given for about 5 weeks; they eventually become about 5 times as large as control tumors.—W. H. W.

1577. *Experimenteller Beitrag zur Kenntnis der Aetiologie von Sarkom.* (*The Etiology of Sarcoma.*) Yamagiwa, Suzuki and Murayama. Gann, Ergebn. d. Krebsforsch. in Japan, Tokyo, 1921, **15**, 1.

In one rabbit out of about 200 injected in the mammary region with tar, there appeared a fibromyxosarcoma about 2 years after the beginning of the experiment. The malignant nature of the growth was proved by its inoculability.—W. H. W.

1578. *Die künstliche Erzeugung des Papillären Adenoms am Kaninchen-Magen.* (*Artificial Production of Papillary Adenoma in the Stomach of the Rabbit.*) Ishibashi and Ohtani. Gann, Ergebn. d. Krebsforsch. in Japan, Tokyo, 1921, **15**, 2.

After opening the abdomen, the investigators injected 0.5 cc. of coal-tar into the submucosa of the stomach and intestine. From 2 to 7 weeks later, adenomata were found in the stomach but never in the intestine. Hence the gastric epithelium appears to be more disposed to proliferation than that of the intestine.—W. H. W.

DISEASES OF THE BLOOD, LYMPHATICS AND DUCTLESS GLANDS

1579. *Studies of the Blood of Normal Monkeys.* E. B. Krumbhaar and J. H. Musser, Jr. J. Med. Research, Bost., 1921, **42**, 105–109.

The report is made of a study of the blood of 13 *Macacus rhesus* monkeys. The results are given for the numbers of erythrocytes, leucocytes, reticulated erythrocytes, and platelets; the average percentage of hemoglobin, and the resistance of the erythrocytes to hypotonic salt solution are also given. The results are compared with the recorded figures of other observers.—A. C. E.

DISEASES OF THE DIGESTIVE SYSTEM

(*See also Numbers 1507, 1511, 1604*)

1580. Über Darmbakterienforschung. (*Examinations of Intestinal Flora.*) E. MOROR. Ztschr. f. Kinderh., Berl., 1921, **29**, 56–58.

In studying the transformations of the bacterial flora of the intestine under various conditions of diet, consideration must be given to (*a*) the effect of different foodstuffs upon the morphology and variability of the organism, particularly as regards the appearance of involution and degenerative forms of the organism under environmental variations, and (*b*) the development of more simple and sure procedures for the isolation and identification of the bacterial types.—G. H. S.

1581. Über Darmbakterien. I. Züchtung der Buttersäurebazillen auf Kok-Milch. (*Intestinal Bacteria. I. Cultivation of the Butyric Acid Bacillus upon a Coke-Milk Medium.*) A. ADAM. Ztschr. f. Kinderh., Berl., 1921, **29**, 59–64.

The medium employed consisted of skimmed-milk (whole milk is unsuited) to which washed, sterile, pieces of coke were added. Before use the oxygen was removed by heating and after inoculation with the fecal material the tubes were again heated for 2 to 3 minutes at 70°C. to eliminate the less resistant organisms. In this medium a stormy fermentation occurs within 24 hours, and microscopic examination reveals the presence of numerous non-motile butyric acid bacilli with relatively few motile organisms. Further cultivation and isolation can be effected by plating out upon a 1–2 per cent lactose agar under anoxybiotic conditions. Organisms with rounded ends, Gram-positive, and which gave the characteristic butyric acid odor were considered as butyric acid bacilli. The non-motile forms are somewhat more slender than the motile. Spore formation appeared only among the motile forms.

Addition of coke, which simply acts as an adsorbent, facilitates the isolation of other intestinal anaerobes from infants.

In the case of the butyric acid bacillus it was found that an abundant growth could be secured in 1 per cent lactose bouillon to which coke had been added without taking any precautions to secure anaerobiosis; while in the same medium without the coke and sealed with a heavy layer of liquid paraffin but slight, if any, growth could be obtained. The mechanism of the adsorption processes is discussed.—G. H. S.

DISEASES OF THE GENITO-URINARY SYSTEM

(*See also Numbers 1514, 1595, 1606*)

1582. Recherches sur le spirochétose spontanée du lapin. (*Spontaneous Spirochetosis in the Rabbit.*) C. LEVADITI, A. MARIE AND ISAÏCU. Compt. rend. Soc. de biol., Par., 1921, **85**, 51–54.

A spirochete, closely resembling *Treponema pallidum*, which spontaneously affects rabbits with lesions resembling syphilis has been noted by a number of investigators, and has been named *Spirochaeta cuniculi* by Jakobsthal. The lesions produced are usually localized to the genital tract, although sometimes the nostrils are involved. An intensive study has been made of three strains which have been secured from naturally infected animals. The first strain was isolated from the ulcerative lesions of the nares. The infection was transmitted to two other normal rabbits by preputial scarification with inoculation. In these animals the spirochetes could be demonstrated in the lesions after 50 and 86, days respectively. A third passage was secured, the lesions with organisms being found in this case 14 days after the inoculation. The other strains gave similar results with vaginal inoculation. The histology of the lesions was studied, and it was found that the spirochetes were present in large numbers in the germinative layers of the epidermis. The epithelial cells appeared entirely surrounded with the organisms, and in many cases they appeared to be actually invading the cells themselves. The infection was transferred from one animal to another by direct contact. The spontaneous infection of the rabbit remains localized. Apparently all rabbits are susceptible to infection; white rats and mice are resistant. Therapy with arsenicals, and other chemicals, was successful.—G. H. S.

1583. Syphilitischer Primäreffekt an der Lippe bei einem 11 Monate alten Kinde. (*Primary Syphilis of the Lips in an Eleven Months Old Child.*) IDA M. HANDOVSKY. Ztschr. f. Kinderh., Berl., 1921, **28**, 216–217.

Primary lues of the type reported is not common in infants. *Treponema pallidum* was demonstrated in the lesions and the Wassermann reaction was four-plus. Neosalvarsan therapy proved efficacious. Infection was probably derived from the mother, who showed mucous patches in the mouth when the child was 7 months of age.—G. H. S.

1584. An Atypical Bacillus paratyphosus B Infection. HUGH J. MORGAN. Johns Hopkins Hosp. Bull., Balt., 1921, **32**, 195–201.

Morgan describes an organism isolated from the blood and urine of a case of cystopyelitis following urethral stricture, which morphologically and culturally corresponded to *B. paratyphosus* B but serologically and antigenically showed marked differences from stock strains of this bacillus. It would seem to fall in that large group of organisms which has been rather loosely called *B. paratyphosus* C but which Morgan believed should rather be considered variants of *B. paratyphosus* B.—F. W. H.

DISEASES OF THE NERVOUS SYSTEM

1585. Preuves de l'existence des porteurs sains de virus encéphalitique. (Proof of the Existence of Healthy Carriers of the Virus of Epidemic Encephalitis.) C. **Levaditi**, P. **Harvier and** S. **Nicolau**. Compt. rend. Soc. de biol., Par., 1921, **85**, 161–166.

Experimental evidence is cited of the presence of the virus in the salivary secretions of a healthy carrier.—G. H. S.

1586. Etude de la réaction de Weichbrodt dans le liquide céphalorachidien. (The Weichbrodt Reaction in the Cerebrospinal Fluid.) **Georges Guillain and Ch. Gardin**. Compt. rend. Soc. de biol., Par., 1921, **85**, 143–146.

The Weichbrodt reaction, albumin determinations, Nonne and Pandy reactions, the leucocyte counts, the Wassermann reaction and the reaction with colloidal benzoin were employed in testing 50 spinal fluids. The Weichbrodt reaction was always negative in amyotrophic lateral sclerosis, polyneuritis, encephalitis lethargica, alcoholic and traumatic epilepsies, and dementia precox. In several cases of tuberculous meningitis it gave a delayed slightly positive reaction, and in general paralysis, tabes and cerebrospinal syphilis strongly positive reactions were secured. A correlation of the Weichbrodt reaction with the other tests would indicate that the reaction is of high diagnostic value. Even in the absence of a positive Wassermann reaction a positive Weichbrodt, together with a positive colloidal benzoin test, warrants the diagnosis of syphilitic infection.—G. H. S.

1587. Un cas de contagion d'encéphalite lethargique. (A Case of Contagion of Lethargic Encephalitis.) **Georges Guillain**. Bull. Acad. de méd., Par., 1920, **84**, 321.

The author's patient, Dr. X—, lives at Paris, the patient's father lived at L—, a city in the center of France. At the end of January, 1920, the father of Dr. X—was attacked with lethargic encephalitis, from which he died 9 days later. There were several other cases of lethargic encephalitis in L— at this time.

Dr. X— returned to L— in August, 1920, staying there 15 days. During this period he lived in the room where his father had previously died, and used some of his father's clothing, bed linen, and handkerchiefs. He lived in the same house with his mother and uncle, who had previously nursed his father during the latter's fatal illness. Fifteen days after the return of Dr. X— to Paris he developed symptoms of lethargic encephalitis, which ran a course of several months.

The disease was apparently contracted in one of two possible ways: from his mother or uncle who may have remained carriers after caring for his father, or else from the inanimate objects, such as clothing, etc., used by Dr. X— during his stay at L—. The author realises that the rôle of carriers in lethargic encephalitis is important and generally accepted, yet he does not believe that the possible rôle of inanimate objects can be disregarded. He urges disinfection of rooms and objects used by patients.—J. E. W.

DISEASES OF THE RESPIRATORY SYSTEM

(Except Influenza and Tuberculosis)

1588. Bronchial Spirochetosis. **W. A. Bloedorn and J. E. Houghton**. J. Am. M. Ass., Chicago, 1921, **76**, 1559.

Bronchial spirochetosis is suggestive of pulmonary tuberculosis and exists in the United States. *Spirochaeta bronchialis* can be demonstrated in the sputum. The degree of contagiousness is probably slight, but it appears that carriers exist. The disease responds readily to treatment with arsenic preparations.—P. G. H.

INFLUENZA

(See Number 1508)

TUBERCULOSIS

1589. Chaulmoogra Oil in the Treatment of Tuberculosis. **William L. Culpepper and Marjorie Ableson**. J. Lab. & Clin. M., St. Louis, 1921, **6**, 415–426.

Culpepper and Ableson report the results of the treatment of tuberculous guinea pigs with 1 per cent solutions of the acid sodium salts of the 4 acid fractions of chaulmoogra oil administered intraperitoneally. Of the treated guinea pigs only 1 out of 12 died as compared with 11 out of 12 of the untreated animals. There were also marked differences in the pathologic findings between treated and untreated guinea pigs, the advantage being in favor of the former.

It would appear that the acid sodium salt of the "A" and the "B" acid fractions of chaulmoogra oil is the most potent. All of these acid sodium salts in 1 per cent solution proved to be non-toxic to and caused no pathologic changes in the control guinea pigs. In a dilution of 1:10000 they were also bactericidal for tubercle bacilli.—F. W. H.

1590. Tuberculosis in Guinea Pigs with an Experimentally Produced Endothelial Leucocytosis. F. A. McJunkin. J. Med. Research, Bost., 1921, **42**, 201-207.

Intraperitoneal injections into guinea pigs of large amounts (just under the lethal dose) of killed saprophytic non-virulent tubercle bacillus, smegma bacillus, or timothy-hay bacillus cause an increase in the endothelial leucocytes of the blood which appears in 2 or 3 days and persists for a week or more. This blood picture is similar to that of tuberculous guniea pigs during the week or two preceding death. Injections of *B. smegmatis* and *B. phlei* unquestionably influenced the gross and microscopic character of the lesions in tuberculous guinea pigs provided doses large enough to maintain the endothelial leucocytosis were given.—A. C. E.

1591. Zur Frage des frühzeitigen Nachweises aktiver Tuberkulose bei Kindern mit Hilfe der Eigenharnreaktion nach Wildbolz. (Early Detection of Active Tuberculosis in Children by the Auto-Urine Inoculation Method of Wildbolz.) O. H. Kotzulla. Ztschr. f. Kinderh., Berl., 1921, **29**, 93–101.

The children tested were classified into 4 groups; viz.—Group I, non-tuberculous (4 cases) and tuberculous infected but inactive (8 cases); Group II, 13 cases of active pulmonary tuberculosis, 4 of catarrhal tuberculosis of the hilum, 2 of tuberculous lymphoma, 2 of glandular tuberculosis, and 1 each of bone, peritoneal, intestinal, and meningitic tuberculosis; Group III, 9 cases of tuberculosis of the bronchial lymph glands; Group IV, 4 children suspected of an active tuberculous process. Those of the first group gave negative Wildbolz reactions; those of the second group reacted positively; those of the third group gave weak, but nevertheless positive reactions; while in the last group varied reactions were secured. The conclusion is that the reaction is specific for active tuberculosis with certain exceptions, such as nephritis and staphylococcuria, and in renal tuberculosis where there is present an insufficiency of both kidneys. It is considered of value in the early detection of the infection.—G. H. S.

1592. The Migration and Fate of the Mononuclear Phagocyte of the Lung. H. H. Permar. J. Med. Research, Bost., 1921, **42**, 209–225.

The experiments consisted in intratrachial injections of 1–2 cc. of a suspension of powdered carmine in salt solution, allowing the animal to live for varying periods of time up to 6 days following the injection. The series included 23 animals. All showed that phagocytosis of the injected pigment began almost at once, being first taken up by the endothelial phagocytes present in the alveoli at the time of the injection. After about one hour the phagocytic cells had slightly increased in number and more pigment had been engulfed. At the expiration of 24 hours practically all the pigment was intracellular. But the endothelial phagocytes did not leave the alveolus at a rapid rate. Often there was very little difference in the picture at the end of 5 or 6 days. The small bronchioles were much more readily cleared.

The study showed that certain of the phagocytes wandered outward along the air passages to be expelled in the sputum. But the more important mode of disposal of intra-alveolar foreign particulate matter in the lungs free of inflammation and edema is through the invasion of the pulmonary tissues by the mononuclear pigment bearing phagocytes. This occurs mainly through the atrial wall, as the terminal lymphatics are readily accessible from this point. The mononuclear phagocytes pursue a slow, uncertain course along the lymphatic channels and numbers of them eventually reach and become stationary in the lymph nodes at the hilus.

This method of study cannot always be interpreted in terms of direct comparison with the reaction of these cells to bacteria. But it would seem probable from this work that tubercle bacilli giving rise to isolated foci in the peribronchial lymph nodes are carried there by endothelial phagocytes from air sacs or terminal bronchioles.—A. C. E.

DISEASES OF CHILDREN

(See also Numbers 1559, 1583)

1593. Beitrag zum Resistenzproblem bei Frügeborenen. (The Question of Resistance in Premature Infants.) R. Kyrklund. Ztschr. f. Kinderh., Berl., 1921, **28**, 168–182.

The bactericidal activity of the sera of 60 infants weighing 2500 gm. or less at birth was determined. The results indicated that prematurity itself was without effect upon the development of antibacterial antibodies. Infectious conditions, other than those which might be associated with digestive disturbances, had no effect upon the bactericidal titre of the serum. Conditions involving impaired digestion invariably caused a decrease in bactericidal activity. The bactericidal potency of the serum is more readily affected in premature infants than in full-term infants.—G. H. S.

1594. Ernährungszustand und Infektion. (The State of Nourishment and Infection.) E. Wertheimer and E. Wolff. Ztschr. f. Kinderh., Berl., 1921, **28**, 295–309.

The incidence of infection, the duration of infection, and the mortality rate were analysed in several groups of children. Striking differences were apparent, all in favor of the adequately nourished children. The authors reason that since antibody formation is a function of the cell, any condition, such as undernourishement, which tends to impair the activity of the cell must result in decreased resistance to infection.—G. H. S.

SEROLOGY

(*See also Number 1598*)

1595. *Wassermann Test with Secretions, Transudates and Exudates in Syphilis.* JOSEPH V. KLAUDER AND JOHN A. KOLMER. J. Am. M. Ass., Chicago, 1921, **76**, 1635.

In the tests milk, saliva, seminal fluid and transudates from syphilitics were used with an antisheep hemolytic system and a cholesterolized antigen. All specimens were titrated for anticomplementary activity. Milk and saliva were highly anticomplementary. Out of 10 specimens of milk, 3 were found positive. Out of 20 specimens of saliva, only one weakly positive test was obtained. In 30 specimens of seminal fluid but one moderately positive result was obtained. Negative results were obtained from 10 specimens of aqueous fluid from the anterior chamber of the eye. Positive tests were obtained from 11 specimens of exudates and transudates. The authors believe that the complement fixing antibody in the spinal fluid is dual in origin, neural and hematogenous. Positive reactions were observed in surface fluids of chancres.—P. G. H.

1596. *Au sujet de la centrifugation, appliquée a l'agglutination.* (*Centrifugation Applied to Agglutination.*) A. BECKERICH AND G. ENGEL. Compt. rend. Soc. de. biol., Par., 1921, **85**, 105–106.

Graphs are presented showing the effect of centrifugation for different lengths of time upon the speed of agglutination.—G. H. S.

1597. *The Nature of Hemolysins.* J. T. CONNELL AND L. E. HOLLY. J. Bact., Balt., 1921, **6**, 89–102.

The hemolysins of two organisms (*Streptococcus hemolyticus* and *B. megatherium*) are reported upon here. Both of these appear early in the incubation period of cultures and both are powerful. The latter is more easily prepared. The authors have attempted to produce artificial hemolysins by recourse to the fat complexes which are characteristic of the organism whose lysins they were attempting to imitate. (The fat complexes used are not described in this paper.) None of the artificial lysins are as potent as the natural ones. This is associated with the complex colloidal nature of the natural antigen. The colloidal nature of the lysin is indicated by the inactivation effectd by filtration through a Berkefeld filter. Both the natural and artificial hemolysins are comparably hemolytic; both are inactivated by heat at approximately the same temperatures. Both lysins of *B. megatherium* are inactivated by adsorbents acting under similar conditions. The natural streptolysin is not inactivated by adsorbents, nor the artificial one in the presence of serum. Neither the natural nor the artificial streptolysin has yielded a satisfactory antilysin. Both the natural and artificial megatheriolysins arouse the production of strong specific antilysins in rabbits.

The authors consider that the hemolysins of the orgnisms studied consist of the respective fat antigens of the bacteria existing in definite colloid states.—I. S. F.

1598. *Das Verhältnis der Komplementbindung zu Meinickes Reaktion bei Scharlach.* (*The Wassermann Reaction and Meinicke Reaction in Scarlet Fever.*) E. THOMAS AND K. PESCH. Ztschr. f. Kinderh., Berl., 1921, **28**, 208–215.

Complement fixation (Wassermann) and the Meinicke reaction were performed on 150 sera from scarlet fever children (50 cases). Of the 150 sera 36 gave positive Wassermann reactions and 15 more were questionable. The Meinicke reaction was negative in all. The positive Wassermann reactions occurred particularly in the first week of the disease, tended to disappear in the 3rd week, reappeared in the 4th and 5th weeks, and finally disappeared in the 6th week. The more severe cases, and those with complications, gave more positive reactions than did the mild cases.—G. H. S.

SERUM THERAPY

(*See also Numbers 1504, 1548, 1549*)

1599. *Sur un moyen de vaincre rapidement la résistance de la spore charbonneuse a l'action de l'alcool-éther.* (*Destroying the Resistance of the Anthrax Spore with an Alcohol-Ether Mixture.*) A. STAUB AND P. FORGEOT. Compt. rend. Soc. de biol., Par., 1921, **85**, 58–59.

Immune sera produced by the injection of an asporogenous strain of *B. anthracis* were effective in protecting guinea pigs against the asporogenous strain but were not efficient in protecting against sporogenic strains. The attempt was made to so treat the spores that they could be used in the preparation of the vaccine. Treatment with an alcohol-ether mixture was not effective, since even after contact with the mixture for 25 days the spores were still viable. After 31 days the spores were inactive. The effect of a solution which will disolve cellulose—Schweitzer solution—was determined. Contact with this solution for one-half hour followed by contact with the alcohol-ether solution for 24 hours resulted in the death of the spores.—G. H. S.

1600. Serum Desensitization. George M. Mackenzie. J. Am. M. Ass., Chicago, 1921, **76**, 1563.

A test for sensitiveness to serum should be made before serum is administered. An intracutaneous test with horse serum in a dilution of 1: 10 injecting 0.1 cc. or less should be made. A control test with physiologic salt solution or with rabbit or sheep serum should also be made. After half an hour the reaction can be interpreted. If there is a definite enlargement of the elevation caused by the injection and if the injection wheal is surrounded by a zone of erytheme, the test is positive, unless the control test shows a similar result. The size of the wheal and its surrounding zone of erythema give a rough index of the degree of sensitiveness. There are some exceptions when the test fails to give the desired indication.—P. G. H.

HYPERSENSITIVENESS—ANAPHYLAXIS, ALLERGY

(*See also Number 1600*)

1601. The Route and Rate of Absorption of Subcutaneously Injected Serum, in Relation to the Occurrence of Sudden Death after Injection of Antitoxic Horse Serum. Julian H. Lewis. J. Am. M. Ass., Chicago, 1921, **76**, 1342.

The main route of absorption from subcutaneous tissues is through the lymphatics and this absorption is slow. The rate of absorption of horse serum is too slow to account for cases of anaphylactic death. The appearance of horse serum in the blood is hastened by massage and by injection of large amounts. The deaths reported following injection of antitoxic horse serum are probably due to accidental injection into the blood.—P. G. H.

1602. Influence du choc anaphylactique sur le pouvoir alexique du sérum de cobaye. (*Effect of Anaphylactic Shock upon the Complementing Power of Guinea Pig Serum.*) Fernand Arloing and L. Langeron. Compt. rend. Soc. de biol., Par., 1921, **85**, 95–96.

The complementing power of guinea pig serum in the rabbit anti-sheep system was determined both before and after shock. Shock was induced by subdural injection of horse serum in specifically sensitized pigs. No essential differences in the amount of complement could be detected.—G. H. S.

1603. The Alkali Reserve of the Blood Plasma during Protein Shock. A. A. Eggstein. J. Lab. & Clin. M., St. Louis, 1921, **6**, 481–486.

Eggstein finds that the shock following intravenous injection of secondary proteoses and typhoid vaccines into dogs and man is accompanied by a decrease in the alkali reserve of the blood plasma, that there is a definite relationship between this decrease and the lowered blood pressure in toxemic shock, that when the alkali reserve falls below 30 volume per cent, following protein shock, the animal's life is in danger, that the administration of sodium bicarbonate before injection of a toxic protein retards the fall of the blood alkalies to this critical point and that the alkali reserve may be restored to normal in protein shock by the intravenous injection of sodium bicarbonate, which seems to relieve distressing symptoms.—F. W. H.

VACCINE PROPHYLAXIS AND THERAPY

1604. Statistique comparative des cas de fièvre typhoïde observés dans les deux sexes avant et apres la guerre. (*Comparative Statistics of Cases of Typhoid Fever Observed in the Two Sexes before and after the War.*) Émile Sergent. Bull. Acad. de Méd., Par., 1921, **85**, 321.

The author's statistics are based upon 44 cases, 23 of which were typhoid, and the remaining 21 paratyphoid. He publishes his figures as confirming previous conclusions of Chauffard. All the cases were observed in the same hospital service, and are divided into two groups according to whether they occurred in 1911, 1912, and 1913, or in 1918, 1919, and 1920.

In 1911, 1912, and 1913 there were 27 cases, 18 of which were in men and 9 in women, a proportion of 2 men to 1 woman. In 1918, 1919, and 1920 there were 17 cases, of which 4 were in men and 13 in women, a proportion of 1 man to 3 women. The average age of the women in the two groups was the same, namely 26 years. The average age of the men in the first group was 27 years. In the second group the average age of the men had considerably fallen, 3 of the cases being in boys of 15, 16, and 18 years of age respectively. The fourth male case was in a man 41 years of age, who had never been vaccinated.

These statistics show that during the war the curves of the relative incidence of typhoid in men and women crossed, so that now their relative positions are almost reversed. Furthermore, most of the male cases are now in young men not mobilised during the war. The author concludes that one cannot fail to be impressed with the incontestable value of typhoid vaccination as deduced from these figures.—J. E. W.

NONSPECIFIC THERAPY

1605. Studies on the Nature of the Action of Nonspecific Protein in Disease Processes. I. Typhoid Protein (Dead Typhoid Bacilli) and Soluble Toxin. David Murrary Cowie and Rockwell M. Kempton. J. Med. Research, Bost., 1921, **42**, 227–239.

The experiments were undertaken to obtain information as to whether the sterilizing changes which take place in the body after an intravenous injection of foreign protein may be explained on purely physical or physico-chemical grounds. Dead typhoid bacilli were chosen for these experiments because they can be injected into guinea pigs in large doses without causing more than a slight disturbance.

After incubation with diptheria toxin the dead typhoid bacilli did not lessen the effect of the fatal dose when injected simultaneously with the toxin nor when separated from the toxin before its injection. Treatment of the guinea pigs with intravenous injections of dead typhoid bacilli before or after giving the fatal dose of toxin provided no protection.

Guinea pigs were protected from fatal doses of diphtheria toxin by the simultaneous injection of normal horse serum.—A. C. E.

CHEMOTHERAPY

1606. The Spirocheticidal Value of Disodium Ethyl Arsinate (Mon-Arsone). Henry J. Nichols. J. Am. M. Ass., Chicago, 1921, **76**, 1335.

"Disodium ethyl arsinate, or mon-arson, tested on rabbits infected with syphilis shows no spirocheticidal power. The tissues are fatally poisoned as soon as or before the spirochetes are affected.

"For its practical use in syphilis there is no such germicidal basis as exists in case of the arsphenamin group."—P. G. H.

1607. Zur Kenntnis der sog. oligodynamischen Erscheinungen. Ein Beitrag zur Physiologie der Giftwirkung. (On the so-called Oligodynamic Phenomena. A Contribution to the Physiology of the Action of Poisons.) Otto Drechsel. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1921, **53**, 288–311.

Distilled water, when present in sufficient quantities, is injurious to Spirogyra, under all circumstances, due to the lack of nutrient salts, namely, that of calcium. When, a heavy metal is dissolved in distilled water, its action is added to that of the water, so that the cell, lacking the protection of other salts, suffers so much more under the specific action of the metal. The mechanism of the toxic action is discussed.—S. A. W.

MISCELLANEOUS

(See also Number 1592)

1608. Studies on the Resistance of Red Blood Cells. I. Resistance of Red Blood Cells in Health to the Hemolytic Action of Sapotoxin. Chas. Hugh Neilson and Homer Wheelon. J. Lab. & Clin. M., St. Louis, 1921, **6**, 454–462.

The authors performed experiments to determine the effect of various dilutions of sapotoxin on whole blood and on washed red corpuscles when incubated for 5 minutes at from 24.5°–25°C., to determine the length of time an arbitrarily selected dilution of sapotoxin (1:3000) took to completely hemolyze the red cells at a constant temperature and to discover the effect of increased temperature upon the rate of hemolysis in a solution of given strength.

The authors conclude that the presence of the blood fluid about the red cells protects them against the hemolytic action of sapotoxin.—F. W. H.

1609. Studies on the Resistance of Red Blood Cells. II. The Resistance of Red Blood Cells in Disease to the Hemolytic Action of Sapotoxin. Chas. H. Neilson and Homer Wheelon. J. Lab. & Clin. M., St. Louis, 1921, **6**, 486–504.

The authors studied the resistance of red blood cells during pregnancy, in malaria, tuberculosis, typhoid fever, syphilis, lead poisoning, jaundice, anemia, cardiorenal disturbances and malignant growths to the hemolytic action of sapotoxin. In these experiments they used the same technic outlined in their former article, "The Resistance of Red Blood Cells in Health to the Hemolytic Action of Sapotoxin."

Neilson and Wheelon draw the following conclusions: The resistance of red corpuscles to solutions of sapotoxin varies in different diseases and this variation is intimately associated with alterations in the metabolism of cholesterol.—F. W. H.

1610. The Development of the Mononuclear Phagocyte of the Lung. H. H. Permar. J. Med. Research, Bost., 1921, **42**, 147–162.

The chief points brought out by this experimental study are the evidence that in the lung the blood vascular endothelium is capable of producing an abundance of endothelial leucocytes at a rate commensurate with the demand, and that this reaction is in the main localized in the vessels immediately around the site of the irritant. The author believes that the endothelial leucocytes form a very important defense mechanism.—A. C. E.

1611. Russell's Fuchsin Bodies. Guthrie McConnell and Alphonse Lang. J. Med. Research, Bost., 1921, **42**, 99–103.

As a result of their studies the authors conclude that the Russell fuchsin bodies are the result of degenerative changes occurring in the cell protoplasm but not in the nucleus. The type most commonly affected is the plasma cell, but any variety of tissue cell may undergo a similar degeneration. Red blood cells are not concerned in their formation.—A. C. E.

1612. Heterotransplantation of Kidney. Leo Loeb. J. Med. Research, Bost., 1921, **42**, 137-146.

The heterotransplantation of kidney tissue in various species is compared, and inquiry is made as to how far the fate of the heterotransplant depends upon the relationship between the species of host and graft. The reactions following heterotransplantation are described. It was found that after heterotransplantation conditions are generally so unfavorable and the effect of the heterotoxins so marked that independent of their origin various strange tissues are affected in a similar manner. There are, however, some indications that notwithstanding these facts species relationship plays some (although a secondary) rôle in determining the fate of the transplant.—A. C. E.

1613. Leucocytic and Fibroblastic Reactions about Transplanted Tissues. Moyer S. Fleisher. J. Med. Research, Bost., 1921, **42**, 163-170.

In this paper results in auto- and homoiotransplantation of animal tissues are reported, and the reactions are compared with reactions in heterologous transplantation and in immune transplantation.

In his conclusions the author states that it appears that the reactions about transplanted tissues are of a different nature in homologous animals from the reactions in heterologous animals. It is shown that the reactions about the tissues in immunized heterologous animals are essentially of the same nature as reactions in normal heterologous animals with the additional feature that the leucocytic invasion is slowed in the immune animals.—A. C. E.

1614. Autotransplantation and Homoiotransplantation of Cornea, Iris and Lens. Moyer S. Fleisher. J. Med. Research. Bost., 1921, **42**, 171-199.

The reactions following transplantation are described and the results are discussed. Differences were noted in the reactions about auto- and homoiotransplant of iris and cornea. But in the homoiotransplanted lens no difference from the autotransplant was noted. It appears possible that living tissue, either connective tissue or epithelium, is not invaded by host tissue of either the same or different type. The maintenance of balance between tissues would seem therefore to depend, at least in part, upon the life of the tissue.—A. C. E.

1615. A System of Laboratory Examination and Records. John A. Kolmer. J. Lab. & Clin. M., St. Louis, 1921, **6**, 505-519.

This article describes a system of making and filing requests for and reports of laboratory examinations, which may be found useful in hospitals.

This system involves a minimum of time and work in making the request for a laboratory examination and in returning the report and making a duplicate for filing in the laboratory, it gives the clinical data necessary in the interests of intelligent work and cooperation, affords a means for recording the results on the history sheet of each patient in such manner as permits binding and avoids too much bulk; it provides the physician with a record of laboratory examinations which he may use for his private records, and includes a method of filing and recording duplicate reports in the laboratory in such a way as to be readily accessible and to facilitate the compilation of weekly, monthly and yearly reports with a minimum of work and trouble.—F. W. H.

SCIENTIFIC PROCEEDINGS OF THE VIRGINIA (RICHMOND) BRANCH, SOCIETY OF AMERICAN BACTERIOLOGISTS

May 13, 1921

At this, the annual meeting, May 13, 1921, the following officers were elected: Aubrey H. Straus, Chairman; C. F. Scudder, Vice-Chairman; Henry V. Stewart, Secretary-Treasurer.

1616. The Oyster as a Public Health Problem. H. V. Stewart.

The first stage of the oyster, after it has hatched from the fertilized ovum, is spent as a freely swimming animalcule known as "oyster spat." It swims about for a few hours before attaching itself to some solid object preferably free from slime, and immediately begins the development of a shell. The upper shell is produced first as a protection against its enemies and when it has reached a size sufficient to completely cover the young oyster, production begins on the lower shell and continues until both shells are of the same size, after this both shells are formed at the same rate as needed to accommodate the increasing size of the young oyster.

Under favorable conditions of temperature and food supply the young oyster will have increased in size in 6 months to about the size of a half dollar and at the end of a year its greatest dimension is from one and a half to two inches and it is now spoken of as "seed."

The seed oysters are harvested, culled and singled out, and then transplanted to growing beds where they are allowed to remain for about 2 years until they have reached a size sufficiently large to be marketed as food.

The oyster industry in the United States amounts to approximately 50,000,000 bushels; Chesapeake Bay area about 30,000,000 bushels and Virginia about 15,000,000 bushels.

Large and valuable oyster beds are located in the Tidewater Section of Virginia near large centres of population and therefore subject to sewage pollution, and unless these areas are examined at frequent intervals by experienced analysts and polluted areas adequately policed by proper state authorities great harm may result to the consuming public and a great loss to the oyster industry of the state.

The Fisheries and Food Departments of Virginia are handicapped by lack of necessary authority to equip and maintain laboratories and engage competent analysts, but must depend for this service on another state official who has no interest in employing analysts experienced in this character of examinations.

Emphasis was laid on the necessity for laboratory examinations and surveys of beds being made and interpreted by experienced bacteriologists.—*Author's abstract.*

Medical Lib.

The Subject Index for Volume IV will be published in an early issue

VOLUME V NUMBER 9

ABSTRACTS
OF
BACTERIOLOGY

UNDER THE EDITORIAL DIRECTION OF THE
SOCIETY OF AMERICAN BACTERIOLOGISTS

SEPTEMBER, 1921

EDITOR
A. PARKER HITCHENS

It is characteristic of Science and Progress that they continually open new fields to our vision:—PASTEUR

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ABSTRACTS OF BACTERIOLOGICAL LITERATURE

CHARACTERIZATION AND CLASSIFICATION

(See also Number 1775)

1617. Gonococcus Types. 2. John Hermanies. J. Infect. Dis., Chicago, 1921, **29**, 11–28.
The author discusses the antigenic properties of subtypes of the main types which he described in a previous paper (J. Infect. Dis., 1921, **28**, 593). By the use of absorption tests it was found that the agglutinins of certain strains of the subtypes of Type 2 possessed a common agglutinogen in varying amounts and the author draws the conclusion that such strains may easily revert to the parent type or by rearrangement of the agglutinogenic properties, cause the formation of new types from the parent strain.—L. C. H.

1618. A Study of the So-Called Parameningococci. Louis Cronstedt. J. Path. & Bacteriol., Edinb., 1921, **24**, 211–216.
A brief account is given of the work of Dopter, Wollstein and Chievitz and Jonsson on meningococci and parameningococci. It is pointed out that both Dopter and Wollstein considered the parameningococcus to be a special strain of meningococcus, while the observations of the Danish workers showed that strains of meningococci, once agglutinable, lost this property on repeated subculture.

Four different agglutinating sera were used in these experiments:

1. A monovalent serum prepared from a typical meningococcus, in rabbits, and designated Serum L-5.
2. A monovalent serum prepared in rabbits from a strain that was inagglutinable in a polyvalent serum, therefore parameningococcus—designated Serum 3.
3. A polyvalent therapeutic serum—Serum A.
4. A polyvalent therapeutic serum—Serum B.

Summary of agglutination reactions with different sera, at 55°C. for 2 hours. (S= spontaneous agglutination):

STRAIN	SERUM L-5	SERUM 3	SERUM A	SERUM A	SERUM A	SERUM B	SERUM B	ORIGIN OF STRAINS
1	1:100	1:400	0	0	0	1:25	1:400	1–13; from contacts with one active case—meningococci
2	1:100	0	1:800	1:100	1:50	1:100	1:800	
3	1:50	1:800	0	0	0	1:100	1:800	
4	1:100	1:100	0	0	0	1:200	1:800	
5	S	S	1:800	S	S	S	S	
6	1:200	1:400	0	S	S	1:100	S	L-4p; from an active case, a typical para strain
7	1:25	0	1:25	1:100	1:200	1:50	1:100	
8	1:50	1:800	0	1:400	S	1:100	S	
9	1:100	—	1:50	1:200	1:100	1:50	1:50	
10	1:200	1:400	0	S	1:100	1:100	1:800	
11	1:100	1:400	0	1:200	1:200	1:200	1:800	
12	—	—	1:800	—	—	—	—	
13	1:100	1:400	0	0	0	1:50	1:200	
L-5	1:800	1:800	1:800	1:800	1:800	1:800	1:800	
L-4p	1:50	1:100	1:800	1:400	0	1:800	1:50	
Generation...	28	24	1	19	33	15	32	

The variability in agglutination of the 13 strains, all probably derived from a single contact, is marked. It is pointed out that they could lose or acquire agglutinability, and could show an increase or diminution in this property in relation to a given serum, or that the agglutinability of a strain could decrease with one serum while increasing with another (see Strain 2). In other words, a strain of supposed meningococcus could, in subsequent generations, display all the characteristics said by Dopter to apply to the parameningococcus, and vice versa. It is therefore concluded that "the agglutination reaction as the bacteriological diagnostic of meningococci is of no decisive significance, but that the especial stress is to be laid upon the morphological, cultural and biochemical properties."—I. W. P.

1619. Trehalose Fermentation in the Differentiation of the Paratyphoid-Enteritidis Group. Stewart A. Koser. J. Infect. Dis., Chicago, 1921, **29**, 76–72.

The author has found the use of trehalose to be a reliable method of differentiation of the strains of the paratyphoid group, especially of the animal paratyphoid B subgroup. The results obtained checked with serologic tests.—L. C. H.

1620. Les Pseudo-Diphthériques. (*Pseudo-Diphtheria Bacilli.*) Louis Martin and Georges Loiseau. Rev. d'hyg., Par., 1919, **41**, 97–103.

Pseudo-diphtheria organisms are described as always short, while the true diphtheria are usually long. The pseudo-organisms are not fatal to guinea pigs as are the true diphtheria bacilli; the former produce no antibodies even when given in large quantities. The former do not form acids, most of them causing the media to become alkaline; the latter attack glucose and develop acids in the early stages of the cultures. The pseudo-organisms are much more resistant to gram-decolorization.—J. B.

NEW SPECIES

(*See Number 1640*)

BACTERIAL NUTRITION AND METABOLISM

(*See also Numbers 1696, 1710, 1714, 1715, 1716*)

1621. A Study of the Preparation of Diphtheria Toxin. K. G. Dernby and Hans David. J. Path. & Bacteriol., Edinb., 1921, **24**, 150–159.

Previous work done by Dernby and Avery (1918) on the growth of the pneumococcus suggested that since with the diphtheria bacillus also considerable acid was produced during growth, the initial reaction of the broth had to be fixed at such a point of alkalinity that after incubation the lower limit in pH was not reached. It was found that when sugar was present in the broth, even the small amount contained in the veal used, the diphtheria bacillus produced acid but no toxin. The limiting reaction for growth was found to be about pH 6.5.

An attempt was made to determine the optimal hydrogen-ion concentration for the growth of the diphtheria bacillus, buffers being added to prevent too great changes in the reaction (Na_2HPO_4 and KH_2PO_4). Broth was tubed in 6 cc. quantities and the cultures were incubated at 37°, growth being estimated arbitrarily according to pellicle formation, as follows: (0) no growth; (1) traces; (2) pellicle formation starting; (3–4) thin pellicle; (5–6) thick pellicle, heavy crust. The hydrogen ion concentration was determined after Clark and Lubs, with the methods described by Dernby and Avery. In all cases studied the curve of growth fell within the range pH 6.0 to 8.5, the optimum being apparently 7.2 to 7.6.

A standard broth medium was evolved for the growth of the diphtheria bacillus, the usual methods being modified in the use of autolysed instead of fresh veal and the use of ordinary yeast instead of *B. coli* to ferment the muscle sugar. The best initial pH was found to be 7.3. Yeast-fermented broth tested immediately after sterilization (110° for 20 minutes) was found to have increased in alkalinity, due probably to the volatilization, during heating, of the free and bicarbonate-bound CO_2 with a consequent relative concentration of sodium carbonate. If the broth was allowed to stand 2 days before testing, the original alkalinity was found to be restored, probably from the absorption of CO_2 from the air. It is noted that all pH measurements should be made at room temperature, since the dissociation constant of the indicators varies at different temperatures. The formula for the standard broth was as follows:

Fresh, finely-chopped veal	6 kgm.
Tap water	12,000 cc.
Ordinary distillery yeast	70 grams

Incubate the mixture at 36°C. for 16 hours, and press through cheese cloth. To the still warm broth add 1.5 per cent Witte peptone, 0.4 per cent NaCl and enough N-NaOH to give an initial pH of 7.2–7.3. Boil for some minutes, filter while warm through paper and distribute in 1 liter flasks. Sterilize 20 minutes at 110°. Keep at room temperature 2–3 days before inoculating. If at this time the pH is more than 7.4, a few drops of sterilized N-HCl should be added.

For toxin production, 1 liter of the broth was inoculated with 3 cc. of a 24-hour culture of strains known to be good toxin producers, the flasks being incubated at 36° for 8–11 days when toluene was added and the cultures filtered through paper. Toxins with an m. l. d. above 0.01 cc. were not used for practical purposes. The best toxin was obtained with an initial pH of 7.2–7.5 (.002–.003 cc. for the m. l. d.), giving on the eighth day a pH of 7.9–8.3. In two cases in which the alkalinity on the eighth day had reached 9.0, the m. l. d. was found to be greater than 0.01 cc., showing that too great an alkalinity was not desirable. Cultures with an initial pH of 7.0 took longer to produce the same amount of toxin than cultures with an initial pH of 7.5.

It is thought that with an initial pH of 7.2–7.4 the optimum final pH of 8.0–8.3 should be reached on the eighth day.—I. W. P.

1622. Some Observations on the Biological Characteristics of Bacillus botulinus. P. F. ORR. Proc. Soc. Exper. Biol. & Med., N. Y., 1919, **17**, 47.

In a study of 16 strains of *B. botulinus* isolated, during the past 5 years, from sources in connection with outbreaks of food and forage poisoning in the different parts of the United States, the author found that (1) 37°C. was the most favorable temperature for growth and spore production, instead of 22°C. which has been the general view as the optimum temperature. Toxin is readily formed also at body temperature; (2) it is possible to recover at autopsy of guinea pigs which have been fed or injected with cultures of *B. botulinus*, the organism frequently from the liver or spleen, and occasionally from the heart's blood, the kidneys and pancreases; (3) guinea pigs which have been fed or injected with toxin-free spores of *B. botulinus*, Nevin strain, have died with symptoms resembling those of botulinus poisoning, which is contrary to the results obtained by other investigators. *B. botulinus* was recovered from the liver and spleen of these animals at autopsy.—L. W. F.

1623. Notes on Cultivation of the Gonococcus. C. E. JENKINS. J. Path. & Bacteriol., Edinb., 1921, **24**, 160–165.

This work was done in the course of some investigations in the preparation of large quantities of detoxicated gonococcus vaccine, for use in a large venereal disease clinic. Whole blood agar was the medium employed, 10 per cent of blood being added to each tube, the final volume being 5 cc.

The following conclusions were arrived at;

1. The optimum temperature for the growth of the gonococcus is 35–36°C.
2. Moisture is necessary to growth and should be provided by keeping the atmosphere of the incubator saturated, and by using a medium with a high water content.
3. The classical description of the gonococcus colony gives its appearance on a medium of comparatively low water content. In the more moist medium used here, the following description of the colony is given; "At their first appearance (8–10 hours) the colonies were pin-point and colorless, but about 6 hours later they had increased in diameter, and become a faint but definite grey in color, and showed a strong tendency to run together. Within 24 hours the surface of the medium was covered by a slimy, faintly grey, transparent growth. The edge was sharply defined, irregularly curved, and showed no evidence of the usual minute crenations. As the growth increased in age it became thicker and more grey, but no other change was seen. Films . . . . showed extremely few degenerative forms at the end of 48 hours, in sharp contrast to . . . . . . cultures grown at 37°C. in a dry atmosphere, where swollen cocci were very numerous."
4. Ten per cent whole blood agar is a satisfactory medium. The reaction of the agar from which it is made should be plus 4 or plus 5 (Eyre).
5. At optimum conditions of temperature and moisture, and when grown on a suitable medium, all strains develop equally; the variations in the amount of growth and in the appearance of the different strains only become manifest when the conditions are more relatively unfavorable. Quick growth seems to necessitate subculturing every 2 or 3 days, as rapidly growing cultures may be lost if subcultured only every 5 days.—I. W. P.

1624. Life-Cycles of the Bacteria and Their Possible Relation to Pathology. R. R. MELLON. Am. J. M. Sc., Phila., 1920, **159**, 874–882.

The writer discusses the question of polymorphism or pleomorphism, involution, and the so-called "secondary invaders" in infectious diseases, in relation to the theory of life cycles in bacteria. While recognizing true pleomorphism and involution forms, he also considers the possibility that some of these morphological variations may occur in pure cultures,—a phase in a life cycle. Also the question is raised if in some instances a so-called secondary invader is not a particular phase in the cycle of the specific organism, although genuine secondary invaders are fully recognized as well. A review of the work of Hort, of Löhnis, and of his own studies, is given, with discussions of specific findings which are quoted in support of the theory.—L. W. F.

1625. The Production of Hydrocyanic Acid by Bacillus pyocyaneus. F. A. PATTY. J. Infect. Dis., Chicago, 1921, **29**, 73–77.

Whole egg broth has been found by the author to be the most favorable medium for HCN production, the optimum reaction being pH 5.4–5.8. Oxygen is necessary for the production of HCN by *B. pyocyaneus*. Marked variations occur among the different strains in their ability to produce this acid.—L. C. H.

1626. Ueber unspezifische Leistungssteigerung. (Non-specific Cell Activation.) WOLFGANG WEICHARDT. München. Med. Wchnschr., 1921, **68**, 39–40.

A guinea pig was skinned, and the head, stomach and intestines removed. The rest of the body was minced and extracted with water and alcohol. The dried and reprecipitated extract in minute amounts increased the multiplication of virulent streptococci in Straub's "normosal." medium. Extraction with aqueous lactic acid gave a more potent product. Similar growth stimulants for pathogens are supposed to be operative under certain conditions in the infected human body.—B. C.

1627. Ueber die Brauchbarkeit pflanzlicher Ersatzmittel der Fleischwassers zur Herstellung von Bakteriennährböden. (The Utility of Plant Substitutes for Meat Infusion in the Preparation of Bacteriological Nutrient Media.) MAX BRANDL. München. med. Wchnschr., 1921, **68**, 143–144.

Extract of oats and of wheat groats gave encouraging results, but certain important bacterial species such as *Bact. typhosum, Bact. septicaemie hemorrhagicae, Bact. paratyphosum, Bact. dysenteriae,* Kruse-Shiga and *Vibrio cholerae* grew indifferently upon media containing them. Yeast extract, 1 per cent, was however found to be satisfactory. Two slight disadvantages in its use are, that growth is not always as profuse as upon meat extract media, and that pigment production is not so pronounced.—B. C.

THE D'HERELLE PHENOMENON—BACTERIOPHAGE

1628. Autolyse transmissible et variations microbiennes. (Transmissible Autolysis and Bacterial Variations.) ANDRÉ GRATIA. Compt. rend. Soc. de biol., Par., 1921, **85**, 251–252.

Further discussion of the characteristics of various strains of *B. coli* derived from a single strain.—G. H. S.

1629. Au sujet de la nature du principe bactériophage. (The Nature of the Bacteriophagous Principle.) R. BRUYNOGHE. Compt. rend. Soc. de biol., Par., 1921, **85**, 258–260.

Three theories have been advanced in explanation of the phenomenon of the transmissible lysinogenic principle. d'Herelle considers the action due to an invisible virus capable of parasitising the bacterial cell, and causing its dissolution. Kabeshima thinks that within the bacterial cell there is a pro-diastase which is activated by the catalysor contained in filtrates of the intestinal contents. Bordet and Ciuca ascribe the bacteriophagous action to a ferment secreted by the bacteria. The only difference between the hypotheses of d'Herelle and of Bordet and Ciuca is in the source of the lytic ferment; whether it is a product of a virus or of the bacterial cell itself. Lack of specificity argues against the principle being a secretion of the bacterial cell and favors the idea that it is a product of a virus which is a parasite within the bacterium.—G. H. S.

PHYSICAL CHEMISTRY

1630. The Changes in the H-Ion Concentration of Various Mediums During Heating in Soft and in Pyrex Glass Tubes. J. R. ESTY AND P. H. CATHCART. J. Infect. Dis. Chicago, 1921, **29**, 29–39.

Due to the absorption of soluble alkalies from soft glass solutions stored in such containers become alkaline. The authors made a comparison of the effect of heating buffered and unbuffered solutions in soft and hard glass. Unbuffered solutions in soft glass tubes became much more alkaline on heating for 20–30 minutes while in hard (pyrex) glass tubes the changes were slight, if any. Phosphate solutions heated in soft glass dissolved more alkali from this glass than could be controlled by the buffer action and the pH concentration fell. No change occurred in the pyrex tubes. A neutral solution does not change much even in soft glass. Alkaline solutions change more than do acid ones. A longer time is necessary to kill the same suspension of spores in corn juice, for example, if heated in soft glass than in hard glass tubes.—L. C. H.

1631. The Ionization Constants of Glycerophosphoric Acid and Their Use as Buffers, especially in Culture Mediums. R. R. MELLON, S. F. ACREE, P. M. AVERY AND E. A. SLAGLE. J. Infect. Dis., Chicago, 1921, **29**, 1–6.

This paper deals with the use of glycerophosphoric acid and its salts in culture mediums. The value of phosphates in culture mediums has long been recognized. The tendency of the usual phosphates to precipitate introduces a factor often detrimental to the growth of bacteria. In contrast to the other phosphates, the glycerophosphates are quite soluble. Much less precipitate occurs in media buffered with the latter, and there is only a moderate amount of precipitate even in alkaline fluids. The authors point out that the use of washed agar, to remove salts, may be dispensed with by the use of disodium glycerophosphate. A further use is in the precipitation of casein, to prevent the precipitation of the calcium and magnesium salts.—L. C. H.

1632. A Stable Single Buffer Solution, pH 1- pH 12. S. F. ACREE, R. R. MELLON, PAULINE M. AVERY AND E. A. SLAGLE. J. Infect. Dis., Chicago, 1921, **29**, 7–10.

A stable buffer solution is described covering a wide range of pH values and forming a continuous, relatively smooth curve.—L. C. H.

BACTERIOLOGICAL TECHNIC

(*See also Number 1845*)

1633. The Production of CO_2 by the Typhoid Bacillus and the Mechanism of the Russell Double Sugar Tube. HENRY J. NICHOLS. J. Infect. Dis., Chicago, 1921, **29**, 82–85.

The usual explanation of the characteristic appearance of a Russell double sugar tube inoculated with the typhoid bacillus is that under the imperfect anaerobic conditions in the butt the bacillus obtains its oxygen by splitting the glucose with consequent production of acid. On the surface of the slant, however, where there is abundant oxygen it has been thought no acid changes occur. However, if such a tube is connected with a tube of pyrogallate solution no change takes place, i.e., apparently no acid is produced, as should be the case, according to the explanation. If a volatile acid is assumed the neutral slant can be explained by the absorption of the acid by the KOH. In an inoculated tube covered with oil the slant becomes strongly acid. In an inoculated tube sealed by heat or by paraffin oil the slant becomes acid. When an inoculated tube is coupled to an uninoculated tube, both slants become acid. All these facts are better explained by the assumption of the production of a volatile acid than by the exclusion or exhaustion of oxygen. By the use of the Eldredge tube it was found that considerable quantities of CO_2 are produced by the typhoid bacillus under various conditions, the largest amount being produced in glucose broth. The ratio of the CO_2 to the total acid production is 7.6–9.5 or about 45 per cent of the total acid produced is CO_2. Consequently the true explanation of the Russell double sugar tube is that the CO_2 is retained in the butt but escapes from the slant, leaving the latter unchanged.—L. C. H.

1634. A Microscopic Method for Anaerobic Cultivation. Arao Itano and James Neill. J. Infect. Dis., Chicago, 1921, **29**, 78–81.

An apparatus is described which is a modification of the moist chamber method. It consists of a double chamber made on a slide, the outer chamber containing alkaline pyrogallate solution and the drop of culture is placed in the inner chamber.—L. C. H.

1635. Beobachtungskammer für Mikroorganismen und Blutkörperchen im ruhenden Medium für Hell- und Dunkelfeldbeleuchtung, nebst Spezialobjektiv. (Observation Chamber for Microorganisms and Blood Cells in a Motionless Medium for Light and Dark Field Illumination, together with a Special Objective.) F. W. Oelze. München. med. Wchnschr., 1921, **68**, 130–131.

A cylindrical pedestal of clear glass is formed by grinding out a circular channel in a thick slide. The diameter of the pedestal is determined by the beam of light from the paraboloid condenser. The fluid to be examined is placed on top of this pedestal and covered, with a fairly thick (0.4 mm.) cover glass. This produces a motionless specimen which permits satisfactory study. A special objective in the form of a glycerin immersion lens is recommended for use in dark field work.—B. C.

1636. Ueber die Benutzung des Hoffmannschen Leuchtbildsverfahren zum Studium von Mikroorganismen, insbesondere zum Nachweis von Tuberkelbazillen in fixierten, gefärbten Präparaten. (The Use of Hoffmann's Method of Illumination for the Study of Microbes, Especially for the Demonstration of Tubercle Bacilli in Fixed and Stained Preparations.) Egon Keining. München. med. Wchnschr., 1921, **68**, 131–132.

Stained tubercle bacilli are more readily observed and more numerous in the dark field than with ordinary illumination; and poorly stained specimens introduce no great difficulty. The study of lower organisms stereoscopically in the dark field gives striking and useful results. In suitable cases, color contrasts afford a great aid in the prompt discovery of parasites.—B. C.

1637. Die Bedeutung des Dunkelfelds für die Untersuchung der Gelbfieber-, Syphilis—und anderer Spirochäten sowie sonstiger Mikroorganismen und kleinster Gebilde in Gefärbeten Ausstrichen und Schnitten (Leuchtbildmethode). (The Significance of the Dark Field in the Study of the Yellow Fever, Syphilis and other Spirochetes, also Various Microbes and Minute Forms in Stained Smears and Section.) Erich Hoffman. Berl. klin. Wchnschr., 1921, **58**, 73–75.

Dark field illumination of stained smears and sections gives very striking pictures. Due care must be taken of the thickness of the slide. Spirochetes assume a peculiar fluorescence and stand out with remarkable clearness even when not completely stained.—B. C.

FERMENTATION INDUSTRIES

1638. The Bacteriology of Pickle Fermentation. Edwin LeFevre. The Canner, 1921, **53**, 39–40.

The author criticizes statements made in article entitled "Changes That Take Place During the Salting of Pickles." (The Canner, Vol. 51, No. 14). These statements relate to the nature and function of the microorganisms concerned in pickle fermentation and are believed to be misleading. Investigations have shown that yeasts are present only as contaminants and have no real value in a brine fermentation. The essential organisms are a group of lacto-bacilli which are always present in vegetables grown in close proximity with the soil. They grow rapidly in the juces of these vegetables with the production of acid, largely lactic. They are quite salt tolerant and their growth is favored by a temperature of 30°C. and the absence of free oxygen. The brine fermentation of vegetables is to be regarded as an anaerobic process.

The author calls attention to the importance of cleanliness in fermenting processes as a means of excluding yeasts, molds and harmful bacteria.—E. L.

1639. Elevages aseptiques d'Anguillula aceti en milieu artificiel. (*Aseptic Growth of Anguillula aceti in an Artificial Medium.*) **Emile Guyénot and A. Zimmermann.** Compt. rend. Soc. de biol., Par., 1921, **85**, 283–284.

In media composed of peptone and salts, or peptone, salts and lecithin, *Anguillula* will live for but a few days. If any autolysate of yeast is added to the peptone-salt medium, life, without reproduction, is maintained for more than 5 months; but if the medium contains all four ingredients—peptone, salts, yeast autolysate, and lecithin—active reproduction takes place.—G. H. S.

MYCOLOGY

(*See also Numbers 1698, 1844*)

1640. Mycose de l'huetre comestible. (*Mycosis of the Edible Oyster.*) **Auguste Pettit.** Bull. Acad. de méd., Par., 1921, **85**, 235.

The author was appointed to investigate an epizootic of the oyster beds on the west coast of France. In certain localities 50 per cent of the oysters had been destroyed by this affection.

The diseased oysters were less in weight than the normal. Their tissues showed a state of aplasia. Microscopical sections revealed cellular infiltration between the hepato-pancreatic tubes and also between the loops of the intestine. In certain portions of the digestive tube the epithelial cells were vacuolated. In these vacuoles are seen the mycelium of a fungus, throughout which there are scattered basophilic granules.

Efforts to cultivate this micro-organism have not been successful. It is placed in the genus *Nocardia*, and given the name *N. matruchoti*. The author is continuing his study.—J. E. W.

DAIRY BACTERIOLOGY

(*See Numbers 1690, 1693*)

COMPARATIVE PATHOLOGY

(*See Numbers 1676, 1790, 1821*)

PARASITIC DISEASES

(*See also Number 1782*)

1641. Die biologische Malariabekampfung in Mazedonien. (*Combatting Malaria in Macedonia by Biological Measures.*) E. **Martini.** Ztschr. f. ang. Entomol., Berl., 1921, **7**, 225–286.

Malaria is widely prevalent in Macedonia, more than one-half the children in many villages showing the organisms in their blood. For this reason attempts were made to protect troops through chininisation. In the summer of 1917 practically every man received a daily dose of 0.3 gr., but with very little result. It was then decided to direct the main work against the mosquitoes.

Measures were directed against permitting mosquitoes to feed on malarious patients and against letting infected mosquitoes bite healthy individuals. An extensive campaign for the destruction of the insects was begun.

Tobacco smoke even in the concentration which it attained in the quarters was not any special protection against the insects. Little use was made of gases or of odorous repellants. Wherever feasible wire screens were used and this was supplemented by the systematic killing of mosquitoes each morning. Bed nets rightly used are a real protection but carelessly used are worse than nothing.

The topographical conditions of the occupied territory and the measures adopted for preventing mosquito breeding are discussed in detail. Lack of materials and, especially, lack of intelligent and sympathetic cooperation on the part of the military authorities prevented the success which should have been obtained.—W. A. R.

1642. Die pathologische Anatomie der Malaria. (*The Pathological Anatomy of Malaria.*) **Hermann Dürck.** München. med. Wchnschr., 1921, **68**, 33–37.

The glial nodules represent undoubtedly a specific response of the nervous tissue to the activity of the intravascular malarial parasites. The nodule is analogous to the tubercle and the syphiloma, being a protective mechanism for the delimitation of the toxic agent in the tissue.—B. C.

1643. Encefalite e meilite causadas por um Tripanosomo T. cruzi. (*Encephalites and Myelites Caused by a Trypanosome, T. cruzi.*) M. **Torres and** J. **Villaca.** Mem. do Inst. Oswaldo Cruz, Rio de Jan., 1919, **11**, 80–89.

Dogs inoculated with *T. cruzi* exhibited alterations of the central nervous system, characterized by the existence of numerous local centers in the medulla and brain.

These are composed of hypertrophied cells of the neuroglia, of cells considered "Abraumzellen" of neuroglia origin and of neuroglia cells showing regressive degeneration. In addition there are in the centers in the brain a greater or less number of plasma cells.

In many of the diseased centers are to be found *T. cruzi* either in the Leishmania stage or as a flagellate. There is an evident relation between the protozoon and the cell invasions.—W. A. R.

1644. Cytamoeba bacterifera in the Red Blood Cells of the Frog. R. W. HEGNER. J. Parasitol., Urbana. Ill., 1921, **7**, 157-161.

Attention is called to the presence in the red blood cells of frogs in this country of a problematic organism which Labbé, 1894, had designated as *Cytamoeba bacterifera.*

In the living condition it resembles very much a trophozoite of the tertian malarial parasite, throwing out and withdrawing pseudopodia on all sides. At the same time enclosed bacilliform bodies are moving about rapidly, creating a flame-like appearance.

The theory that the apparent organism is a vacuole containing bacteria is discussed and the author tentatively concludes that it is a state in the life cycle of a protozoan parasite and that living within it either as hyperparasites or in symbiosis is a bacillus named by Laveran *Bacillus krusei.*—W. A. R.

1645. Ueber Trypanosoma gambiense im Liquor cerebrospinalis des Menschen. (*Trypanosoma gambiense in the Cerebrospinal Fluid of Man.*) EDUARD REICHENOW. Berl. klin. Wchnschr., 1921, **58**, 251-253.

Trypanosoma gambiense as a blood parasite gives comparatively little trouble and is readily mastered; but if it reaches the cerebrospinal canal the prognosis becomes grave. This fact is frequently overlooked. In the infected spinal fluid there is a lymphocytosis, the parasites appear more slender and there is a greater proportion of dividing forms than in the blood. The absence of periodicity of the parasites in the spinal fluid indicates the absence of trypanolytic antibodies that are so effective in the blood. The lymphocytosis in the fluid appears to be the defensive mechanism in the nervous system. The lessons for syphilology to be derived from these facts are obvious.—B. C.

1646. Amoebic Abscess of the Liver with Pulmonary Sequelae. R. BROWN. Calif. State J. M., San Fran., 1920, **19**, 282.

A report of an autopsy with microscopic study, upon the body of a young man who had never been out of California. The author believes the abscesses in the lungs were metastatic by the blood stream from the liver to the lung. The intact diaphragm speaks against direct extension. There was an abscess cavity 12 x 8 inches in size in the lower lobe of the right lung, and a second, younger and probably due to aspiration, 7 x 4 inches in size, in the left lower lobe. Amebae were demonstrated in the sections.—J. R. S.

TROPICAL DISEASES

1647. Prophylaxis and Serum Therapy of Yellow Fever. H. NOGUCHI. J. Am. M. Ass., Chicago, 1921, **77**, 181.

A campaign against yellow fever was carried out by vaccination of the population and by the extermination of mosquitoes (Stegomyia). It was therefore difficult to estimate the exact effect of vaccination, but all those vaccinated escaped yellow fever, although they were, like the unvaccinated, exposed to mosquito bites. Anti-icteroides serum reduces the mortality in yellow fever when used on or before the third day of the disease. The death rate was reduced from 56.4 per cent to 13.6 per cent. When the serum is used after the fourth day of the disease there is no appreciable effect. The vaccine used contained 2000 million (leptospira) per 1 cc. Among 3230 persons vaccinated no cases of yellow fever occurred, while among the unvaccinated 278 cases occurred. The protection conferred by vaccination does not become effective before the tenth day after the last treatment.—P. G. H.

MEDICAL ENTOMOLOGY

(*See also Numbers 1704, 1725*)

1648. Mosquito Breeding in Saline Waters. ANDREW BALFOUR. Bull. Entomol. Research, Lond., 1921, **12**, 29-34.

Several writers, most recently Dalziel, have noted the breeding of anopheline larvae in salt and brackish waters. The subject is of practical importance in anti-malarial work, for the suggestion has frequently been made to abolish ordinary mosquito breeding places by the introduction of salt or of sea-water and in some instances this procedure has actually been carried into effect. This in the case of certain species is useless or worse than useless.

The author, after a brief general discussion, presents an annotated bibliography of the subject dealing almost entirely with mosquitoes known to be vectors of disease.—W. A. R.

1649. The Caudal Tuft of Malayan Anopheline Larvae. W. A. LAMBORN. Bull. Entomol. Research, Lond., 1921, **12**, 91-97.

It has been found difficult to understand how such a fragile creature as an Anopheline larva could withstand the force of a strong current of water. Certain species, particularly *A. maculatus*, *A. karwari*, and *A. aitkeni* occur in streams so swift that their presence would have appeared impossible.

The writer shows that the mechanism which enables the larvae to maintain their position in the water is afforded by a pair of dorsal tail bushes, terminated by hooklets. In certain pupae there is a counterpart in the form of a pair of hooks terminating the paddles.—W. A. R.

1650. Mosquito Notes II. F. W. EDWARDS. Bull. Entomol. Research, Lond., 1921, **12**, 69–80.

A systematic paper, treating largely of new species of which 12 are described.—W. A. R.

1651. A Revision of the Genus Leptoconops, Skuse. H. F. CARTER. Bull. Entomol. Research, Lond., 1921, **12**, 1–82.

The genus *Leptoconops* is a group of minute black Chironomid flies many of which bite man and animals with avidity. So far as is known they are diurnal insects, continuing their activities throughout the hottest parts of the day. They are widely distributed, 3 of the species being reported from the United States. A key to the known species is presented.—W. A. R.

1652. The Binomics of Tabanus aprepes, and other Australian Tabanidae. G. F. HILL. Bull. Entomol. Research, Lond., 1921, **12**, 41–62.

There are described in detail the life history, habits and developmental stages of *Tabanus aprepes* Taylor, and *T. rufinotatus* Bigot, which have been reared from egg to adult.

The first larvae molt of *T. aprepes* commences before or immediately after the young larvae leave the egg and is apparently always completed during the first 6 hours of larval life.

The larvae of this species appear to live entirely in water until they have reached maturity, when they migrate from water to high ground close by, and penetrate into the soil to a depth of 7–15 cm., where they remain in the larval stage, generally with head uppermost, for several months.

The duration of the pupal period during the months June–September varied from 8 to 20 days, the average being 12 days in the case of 10 individuals, whose periods were accurately observed. The factors which determine this wide range in the same batch subjected to the same treatment is not known.

In the laboratory, emergence as adults was at the end of 175 and 190 days. Another specimen remained in the larval stage for 239 days, when it was killed.

Less complete data are given concerning *T. nigritarsis* and *Silvius notatus*.—W. A. R.

1653. The Screw Worm and the Wool Maggot. O. G. BABCOCK AND D. H. BENNETT. Texas Agric. Exper. Station. Circular 27, 1921, pp. 1–15.

It is conservatively estimated that the yearly damage done by the screw worm in this country amounts to $4,000,000. The circular at hand reviews the general features of the life history of the screw worm fly and discusses especially control measures.

The importance of sanitation on a ranch cannot be over-emphasized. A single carcass of a horse or cow may breed out 1,000,000 or more screw flies. Complete burning of carcasses is essential.

Buzzards cannot be depended upon to clean carcasses sufficiently to prevent fly breeding. Moreover, they not only attack weak animals, but they are undoubtedly active agents in the spread of such diseases as anthrax and black leg.

Several methods of poisoning were tested. The most successful and satisfactory was to kill a goat or sheep, skin it, partly gut it and suspend it from a limb of a tree so that the head, neck and shoulders would remain in a tub containing a mixture of about 4 liquid ounces of sodium arsenite or one to one and one-half gallons of arsenical dip mixed with 7 to 10 gallons of water. The bait usually will not remain attractive longer then a week or ten days and should then be burned and replaced.

Traps properly located and baited have proved important aids but neither trapping nor poisoning can be depended upon to control the screw worm.

It is of the utmost importance to avoid the production of wounds and raw sores. When flies are abundant one usually expects a worm case in sheep for every shear cut, unless some good means of prevention is taken. Camphor has been found a valuable fly repellant. Excellent results were reported from the use of a mixture consisting of two ounces of gum camphor dissolved in one pint of heated machine oil. A number of other formulae are given.

The real wool-maggot fly of Texas is the black blow fly, *Phormia regina*. Not only does this fly blow wool; it also is responsible for wormy cases in the heads of cattle that have been dehorned on warm days in mid-winter or early spring. The black blow fly is a carcass breeder; hence its multiplication is prevented by burning carcasses.—W. A. R.

PROTOZOOLOGY

1654. Waskia intestinalis: Its Cultivation and Cyst Formation. MARY JANE HOGUE. J. Am. M. Ass., Chicago, 1921, **77**, 112.

Waskia intestinalis has been cultivated on liquid media: ovomucoid, Locke-egg and ox bile salt medium, also on Boeck's medium of Locke with a few drops of sheep or human serum. *Waskia intestinalis* is a small active flagellate measuring in stained preparations from 5.6 to

7.2 microns in length and from 4 to 4.8 microns in width. There is a rather large cytostome and two anterior flagella. The one coming from the anterior end is long and slender and is used for locomotion. The second flagellum comes from the cytostome and is short and thick. It is used in getting food. The cytoplasm is vacuolated and contains bacteria.—P. G. H.

1655. Notes on Gregarines. Minnie W. Kamm. J. Parasitol., Urbana, Ill., 1921, **7**, 175-178.

Notes on two of Leidy's species, belonging to the genus *Stenophora*, from myriapods and the description of a new species, *Gregarina anthici* from an undetermined species of *Anthicus* (Coleoptera).—W. A. R.

1656. Two New Monostomes from Asia. E. C. Harrah. J. Parasitol., Urbana, Ill., 1921, **7**, 162-165.

The occurrence of the genus *Cyclocoelum* in Asia is established and 2 new species are described, *C. elongatum* from a magpie and *C. obliquum* from *Gallinago gallinago*. The two new species show closer relations to the European than to the Australian species of the genus.—W. A. R.

1657. On some Protozoa Parasitic in Fresh-Water Fishes of New York. R. Kudo. J. Parasitol., Urbana, Ill., 1921, **7**, 166-174.

On the examination of 6 species of fish it was found that *Myxidium leiberkühni* and *Trypanosoma remaki*, common protozoan parasites of European fresh-water fishes of which little has been recorded to date occur also in North American waters.

In addition 2 new species of Myxosporidia, *Wardia lucii*, and *Myxidium moxostomatis*, parasitic in *Lucius reticulatus* and *Moxostoma* sp. respectively, are described.—W. A. R.

ANIMAL PARASITES

(See also Number 1722)

1658. Notes on North American Blood Flukes. H. W. Stunkard. American Museum Novitates, N. Y., 1921, No. 12, 5 pp.

Apparently the first blood fluke noted in this country was a monostome which MacCallum, 1918, collected from the intestine of the turtle *Chelopus insculptus*. This he named *Spirochis* but omitted the specific name. Ward, 1921, gave it the specific name *innominata*, and described another species of blood flukes from turtles as *Proparorchis aterricola*.

A comparison of MacCallum's specimens with those studied by Ward shows them to be congeneric and hence *Proparorchis* falls as a synonym. Similarly Ward's sub-family and family names must give way to *Spirorchinae* and Spirorchidae, respectively.—W. A. R.

1659. The Mode of Infection of Schistosomum japonicum and the Principal Route of its Journey from the Skin to the Portal Vein in the Host. Yoneji Miyagawa and Sakaye Takemoto. J. Path. & Bacteriol., Edinb., 1921, **24**, 168-174.

Two possible routes have been described for the infection of the portal vein by the *Schistosomum japonicum*. Miyagawa (1912-1913) believed that they passed from the skin to the right side of the heart, by way of the lymphatics and small peripheral veins; then through the lungs to the left heart, and so by way of the abdominal circulation to the liver and the portal vein. Narabayashi (1917) on the other hand, believed that they passed from the lungs to the mediastinum, thence down through the diaphragm to the liver and the portal vein. The present experiments were carried out by immersing mice for varying periods in infected water, killing them at intervals and making serial sections of the whole trunk, in order to determine, if possible, which was the real method of entry. The results confirmed the findings of Miyagawa, and were as follows;

"The young worms penetrate actively into the skin, principally into the lymphatic spaces, then for the most part they invade the blood capillaries or the small peripheral veins, later gathering in the right side of the heart. Some of those in the skin tissue pass by the lymphatic vessels to the lymphatic glands, in which some are arrested and killed; others, however, being able to pass through into the emergent veins, finally reach the right side of the heart. The worms in the right side of the heart now pass to the lungs. They are arrested a short time in the lung tissue, owing to the disproportion in the size of the worms and alveolar capillaries. Finally they return to the left side of the heart and are carried through the aorta to the wall of the gastro-intestinal canal, after passing through which they reach their permanent residence (the portal branches of the liver) by the mesenteric veins. Some of the worms in the systemic circulation can directly reach the liver by the hepatic artery."

It is noted that, while the method of invasion described by Narabayashi may occur, it does not seem to the authors to be the principal route followed by the organisms from the skin to the portal vein.—I. W. P.

1660. Fasciolopsis buski Infestation. W. C. Sweet. J. Am. M. Ass., Chicago, 1921, **76**, 1819.

The intestinal parasite, *Fascialopsia*, is frequently encountered in the Shaohsing district, Chekiang province, China. It is found most commonly in the male from 11 to 20 years of age.

Symptoms appear in somewhat more than half the cases. These symptoms are diarrhea, epigastric distress, edema and enlarged abdomen. The ova can be demonstrated in the stools and their presence is accompanied by moderate eosinophilia and a secondary anemia.—P. G. H.

1661. On the Life Cycle of Fasciolopsis buski, Lankester. Koan Nakagawa. Kitasato Arch. Exper. M. Tokio, Japan, 1921, **4**, 159–167.

Fasciolopsis buski is a fluke occurring commonly as a parasite of man in Asia, especially in China. The author's studies were made in Formosa where the parasite is frequently found in pigs, although no human cases have as yet been reported.

The intermediate hosts in Formosa are *Planorbis coenosus* and *Segmentina largillierti*. Encysted cercariae are found attached to water plants and develop to fully grown *F. buski* when fed to dogs and pigs.—W. A. R.

1662. Mode de pénétration des Nématodes dans l'organisme des Mammifères, histotropisme et histodiagnostic. (*Mode of Penetration of Nematodes into mammals: Histotropism and Histodiagnosis.*) E. Brumpt. Compt. rend. Soc. de biol., Par., 1921, **85**, 203–206.

Living matter when placed in an environment where it can manifest its activity always responds to stimuli with definite reactions, of the nature of tropisms. To this rule the parasites conform; the type of reaction depending upon the species, the stage of development, and upon physiological activity. Thus, a given species will be attracted toward a definite organ or even a particular cell. However, the life cycle of the parasite may so modify the type of response that it is only in a given stage of development that a particular tissue is invaded. The force which leads to such selective action on the part of the parasite is termed "histotropism," and if this affinity is confined to a single type of host it is called a "specific histotropism" in contradistinction to an "indifferent histotropism" where several species may serve as hosts. Several varieties of human parasitic conditions are cited to illustrate the histotropic phenomenon. Additional evidence is adduced from experimental infection with *Strongyloides vituli*.—G. H. S.

1663. Sobre os ciliados intestinaes dos mammiferos. (*Intestinal Infusoria of Mammals.*) A. Marques da Cunha. Mem. do Inst. Oswaldo Cruz, Rio de Jan., 1919, **11**, 5–9.

Infusoria living as commensals of mammals occur primarily in the stomach of ruminants or in the caecum of non-ruminants. They are not present in all of those animals but are immediately dependent upon the nature of the food of the host animal. They are generally present in those which feed on grains.

The zoological affinities of these infusoria are much more dependent upon the nature of the food of the hosts than upon the systematic relationship. Thus both the horse and the copybara (a rodent) are hosts of infusoria belonging to the genera *Cycloposthium* and *Paraisotricha*. A related genus to be found in the tapir is here described under the name *Protapirella*.

The new genus is defined as "*Cycloposthiidae*, which in addition to the two caudal stylets at the side of the body, has two others on the dorsal margin." Type species *Prototapirella intestinalis*.

There is appended a list of infusoria parasitic in mammals.—W. A. R.

1664. Sobre as especies brasileiras da sub-familia Subulurinae Travassos, 1914. (*On the Brasilian Species of the Sub-family Subulurinae Travassos, 1914.*) A. L. de B. Barreto. Mem. do Inst. Oswaldo Cruz, Rio de Jan., 1919, **11**, 10–70.

In 1914 Travassos established the sub-family Subulurinae, thus elevating to sub-family rank the nematodes until then included in the genera *Subulura* and *Oxynema*, taking as a type *Subulura* Molin.

The sub-family is here re-defined as follows: "*Ascaroidea, Heterakidae, Polymiariae.* Mouth elliptic or polygonal with two or three indistinct lips. Oesophagus always followed by a bulb. Males with spindle-shaped or oval sucker without chitinous ring; spicules rarely absent (*Heteroxynema*), generally one or two of them, equal or unequal, always accompanied by an accessory piece."

He includes in the sub-family Subulurinae the following 5 genera: *Subulura* Molin 1860, *Oxynema* Linstow 1899, *Cissophyllus* Railliet and Henry 1912, *Heteroxynema* Hall 1916 and *Numidica* nov. gen.—W. A. R.

1665. Contribuições para o conhecimento da fauna helmintolojica brazileira VIII. Sobre as especies brazileiras do genero Tetrameres Creplin, 1846. (*Contributions to a Knowledge of the Helminthological Fauna of Brazil. VIII. The Species of the Genus Tetrameres Creplin, 1846.*) L. Travassos. Mem. do Inst. Oswaldo Cruz, Rio de Jan., 1919, **11**, 71–79.

Eleven of the 22 known species of this genus occur in Brazilian birds. Four of these were discussed in detail in an earlier paper (1914) while the remainder are considered here.—W. A. R.

1666. *O Schistosomum mansoni e a Schistosomatose segundo observaçoes, feitas no Brazil.* (*Schistosomum mansoni and Schistosomatosis Observed in Brazil.*) A. Lutz. Mem. do Inst. Oswaldo Cruz, Rio de Jan., 1919, **11**, 121–155.

Schistosomum mansoni is the only species of blood flukes of man occurring in Brazil or, indeed, in the Americas. While it seems remarkable that in tropical America which imported so many slaves the bladder-fluke never became established we know that this is due to the absence of the intermediate hosts of the latter species.

Due to stool examinations for hookworm many new centers for the intestinal schistosome have been found in Brazil. The indispensable conditions for the existence of endemic centers are, on the one side, a hot climate, on the other, the presence of a species of *Planorbis* which is apt to become an intermediate host. In Brazil *Pl. olivaceus* and at least two more species are easily infected but they do not seem to exist in Rio de Janeiro, or to the south of the city. Studies of a special commission from the Institute indicate that all of the states north of Rio may be considered as infected.

Of numerous snails experimented upon only two species of *Planorbis*, *P. olivaceus* and *P. centimetralis* proved suitable hosts. In some other species of *Planorbis* and in *Physa* the penetration is normally effected but development is arrested after the first stages. Miracidia which try to penetrate in other regions than the antennae or near to the eye of the snail fail to pierce the skin or die shortly afterwards.

Under favorable conditions the first free cercariae may be seen in a little over 30 days. At lower temperatures they appear later, which is probably due to the fact that the sporocysts form new ones instead of cercariae.

White rats were experimentally infected by partial immersion in infested water or the animals may be gently but securely immobilized and part of the bare or shaved skin bathed by means of a wide glass tube containing the cercariae. After half an hour the water is full of tails which the cercariae cast off when they pierce the skin. The animals show signs of irritation, followed for several days by local reaction.

When a piece of skin is removed 20 to 60 minutes after the bath the body of the cercariae may be found in sections. After 3 weeks adult worms are found in the mesenteric veins, which are generally very congested. After 5 weeks the sexual organs are well developed. In experiments with guinea pigs, eggs were not found in the excrement until after a period of 2½ months and then only in small numbers.—W. A. R.

1667. *Ueber Trichinose.* (*Trichinosis.*) H. Strauss. Berl. klin. Wchnschr., 1921, **58**, 121–125.

The course of the infection is different in different individuals. In children the disease pursues a benign course. In adults, quantitative factors perhaps play a part in the outcome. The complement fixation test may be used for diagnosis.—B. C.

1668. *Notes on the Occurrence of Moniliformis sp. in Rats in Texas.* A. C. Chandler. J. Parasitol., Urbana, Ill., 1921, **7**, 178–183.

Examination of wild rats at Houston, Texas, showed the common occurrence of Acanthocephala of the genus *Moniliformis*, a genus of which there are only three previous records for the United States.

Approximately 10 per cent of adult Houston rats were found infested. The number of worms in a single host varied from 2 to 3 up to between 100 and 200. Not infrequently the entire small intestine from just behind the stomach to the ileocecal valve was crammed full.

Decision as to which of three described species or whether a new species is reserved for further study.—W. A. R.

1669. *Un Leptomonas du type L. davidi Laf. chez des Euphorbes de France.* (*A Leptomonas of the Type of L. davidi Laf. in the Euphorbia of France.*) G. Zotta. Compt. rend. Soc. de biol., Par., 1921, **85**, 226–228.

The organism, corresponding in morphological characters to *Leptomonas davidi* Laf. was found in two species of Euphorbia in the Department of Maine-et-Loire.—G. H. S.

1670. *Die Rolle der tierischen Parasiten und Krankheitsüberträger im ostafrikanischen Feldzüge.* (*The Rôle of Animal Parasites and Disease Carriers in the East African Campaign.*) H. Morstatt. Ztschr. f. ang. Entomol., Berl., 1921, **7**, 287–295.

In the East African campaign disease played a rôle which can only be compared with conditions in earlier wars and which in the European regions could have been prevented by modern sanitary measures.

Malaria was the most common and the most important of the tropical diseases. It was everywhere prevalent among Europeans and natives, and the number of sick was especially high in the rainy season.

Of the 5 East African tsetse-flies, *Glossina morsitans* was by far the most widespread and abundant. Only a few cases of sleeping sickness could be attributed, doubtfully, to field conditions. The losses of transport animals through disease carried by tsetse-flies was so great as to halt forward movements repeatedly.

Various small flies, especially gnats belonging to the genera *Simulium*, *Ceratopogon* and *Phlebotomus* were very troublesome in some sections. Sand-fleas were at times a serious pest for Europeans. Lice and bed-bugs are at all times prevalent among the natives but ordinarily are scarcely known among whites. Under camp conditions they naturally become very troublesome. Fortunately there were no outbreaks of typhus.

The tick *Ornithodorus moubata* was widespread and, unfortunately, almost constantly infected. The result was the occurrence of numerous cases of recurrent fever. Other ticks, especially species of *Rhipicephalus* were very common and not only annoying to man, but the carriers of some of the most dangerous diseases of cattle.—W. A. R.

EPIDEMIOLOGY

1671. Considerations sur l'etat sanitaire de la Ville de Lille pendant l'occupation Allemande. (Observations on the Sanitary Conditions in Lille during the German Occupation.) A. Calmette. Rev. d'hyg., Par., 1919, **41**, 3–8.

This account notes the progressive increase in general mortality during the "occupation" from the pre-war rate of 19 per thousand to 27, 29, 30 and 41 respectively for the years 1915 to 1918. This increase is ascribed as primarily due to tuberculosis which increased with terrific intensity and to such diseases as epidemic dysentery, scurvy and organic maladies, (e.g. heart affections) provoked or aggravated by insufficient food. Infant mortality showed a similar increase though the mortality rate for under one year was lowered (16.1 per thousand for 1917); this is explained as due to the better care the infants received, the mothers not being employed in industrial concerns. There was also a great loss in the birth rate—from a total birth of 4,800 in 1913 to only 609 for 1918.

The lack of milk was keenly felt, "not one drop of milk having been distributed to the population in four years." The condensed milk obtained from America was of great value in lessening gastro-intestinal disturbances.—J. B.

1672. Typhoid Fever in Cleveland, Ohio, for the Years 1918, 1919, and 1920. Roger G. Perkins. Pub. Health Rep., Wash., 1921, **6**, 1095–1122.

Statistics of typhoid fever cases occurring in Cleveland during 1918, 1919 and 1920, and an analysis of the factors concerned, are presented in the report. During the 3 years covered, 346 cases of typhoid, due to city conditions, were reported. A small number of cases were due to the drinking of polluted water at bathing beaches, a small number to contacts and a few to contaminated food. The largest number were possibly due to the drinking of unfiltered chlorinated lake water supplied by one of the two water supply systems of the city. This system supplies one-fourth to one-third of the city's population. Tests showed that there was fermentation in 10 cubic centimeter amounts of water for more than half the time indicating inadequate chlorine dosage. The author urges sufficient chlorination to bring the water at all times up to the standard required by the U. S. Treasury Department for common carriers.—I. A. B.

1673. Observations on the Spread and Persistence of the Hemolytic Streptococci Peculiar to Scarlet Fever. Ruth Tunnicliff. J. Infect. Dis., Chicago, 1921, **29**, 91–96.

Hemolytic streptococci were isolated from the floors and walls of rooms occupied by scarlet fever and diphtheria patients, and from the eating utensils, finger nails, face masks and shoes of attendants, in a number of instances. Five of 20 such strains gave serologic reactions indicating that they belonged in the scarlet fever group. Four of these strains were obtained from the eating utensils of scarlet fever patients and one from the face mask of a nurse in attendance. It also seems probable in the author's opinion, that persons associated with scarlet fever may develop tonsillitis without an exanthem and be found to harbor hemolytic streptococci of the scarlet fever group. Agglutination tests with strains from patients have been found helpful in diagnosis.—L. C. H.

1674. Des voies et moyens pratiques de faire entrer l'hygiene dans les masses. (Practical Ways and Means of Introducing Hygiene among the Masses.) Leon Azoulay. Rev. d'hyg., Par., 1919, **41**, 78–89.

Recommendations including the appointments of a minister of health, the formation of definite laws relating to tuberculosis, disinfection, aids to the sick, and better care of children. This would include not only milk stations, visiting nurses, dispensaries and hospitals but local subsidies where necessary and supervision until the ages of 17 or 18 years.—J. B.

CARRIERS OF INFECTION

1675. Series of Typhoid Cases Originating in a Bacillus carrier. Pub. Health Rep., Wash., 1921, **36**, 1565.

A series of 9 cases of typhoid fever among the members of a steamship crew were traced to a carrier who had had typhoid fever 2 months previously.—I. A. B.

1676. Virulent Diphtheria Bacilli Carried by Cats. J. S. Simmons. Am. J. M. Sc., Phila., 1920, **160**, 589–594.

Simmons reports a fatal case of diphtheria in an elderly lady, and submits evidence that the infection had been contracted from a pet cat. The cat had been sick one week before the patient's illness, with "a croupy cough, was unable to swallow food, became very thin, and cried continually." The animal was constantly fondled by the patient, and had often slept in her bed. Cultures made from the patient's pseudomembrane showed a luxuriant growth of diphtheria bacilli, and by animal tests proved to be of intermediate virulence. Cultures were made from the throat of the cat the day after the patient was first seen, which showed bacilli morphologically similar to those cultured from the patient's throat, and the same virulence for guinea pigs. The animal was chloroformed 2 days later, and on post mortem examination showed a nasal pseudomembranous lesion; cultures from this lesion developed diphtheria bacilli. A second cat which often played with the first yielded throat cultures morphologically typical for diphtheria bacilli. This animal was confined in a cage at the laboratory, where it died 8 days later. At necropsy, the vocal cords showed ulcerations covered by greyish white patches of pseudomembrane. Cultures from the lesion showed a growth of diphtheria bacilli, virulent for guinea pigs. Control animals injected with diphtheria antitoxin were used in the series of animal virulence tests; the control animals lived.—L. W. F.

1677. Rat Repression in the City of Manchester. W. ALLEN YOUNG. Pub. Health, Lond., 1921, **34**, 104–111.

A review of the various methods of rat control as allowed and practiced in Manchester. The use of viruses is not recommended because of the danger to human beings, as indicated by outbreaks of enteritis elsewhere. Ferrets and dogs are considered helpful for caring for refuse heaps. The Rodier system of sex selection is not thought to be proven successful as yet. The aid to be derived from the mongoose—if followed by rat proofing—is viewed favorably.

Attention is called to the fact that variation in the methods is probably necessary for permanent results, as rats learn to avoid any one means if long continued.—J. B.

1678. Rat Repression by Sex Selection. GEORGE JENNISON. J. Roy. San. Inst., Lond., 1921, **41**, 355.

A contrast of the various methods of rat extermination, advancing the claims of rat extermination by catching the rats alive, killing the females and freeing the males. The necessity of catching the rats alive is not felt to be a difficulty, as in Tokio 97 per cent of the captured rats are so taken.—J. B.

1679. Legislative Measures for the Extermination of Rats in Denmark. EMIL ZUSCHLAG. J. Roy. San. Inst., Lond., 1921, **41**, 357.

A review by the "Superintendent of Extermination" of the various methods advised for extermination. The use of strychnine, arsenic and sulphurous preparations are forbidden by government regulations; scilla preparations and bacterial cultures are allowed. The writer recommends that municipalities should contribute in part toward the prizes or bonuses awarded for rats. In Denmark 7,000,000 have been so paid for; this does not include the young who doubtless died in nests or the rats kil led by baits and traps. The reports show towns in which 95 to 97 per cent of the houses have been entirely rid of rats, even in one case where the town area included a number of covered canals and streamlets.—J. B.

1680. Die Bekämfung der Mäuseplage im Elsass mit Mäusetyphusbacillen. (*The Extermination of mice in Alsace by the Use of Mouse-Typhoid Bacilli.*) TH. MESSERSCHMIDT. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, Teil I, Orig., 1921, **31**, 137–151.

In 1918, the part of Alsace around Zabern and Colmar was over-run by field mice (*Avricola arvalis* and *Mus agrarius*). This "mouse-plague." was combatted by the use of cultures of a "mouse typhoid bacillus." The cultural characteristics of the organism are not described. During the campaign, 15,000 liters of broth culture were used. Bread, meat and other foodstuffs were soaked in these broth cultures and then placed where they would be eaten by the mice. Thousands of mice were thus destroyed.

No human infections were caused by this organism, although it was scattered widely and handled carelessly in human habitations.—S. B. J.

PUBLIC HEALTH REGULATION

1681. Sur l'etiologie et la prophylaxie de l'encéphalite léthargique; sa déclaration obligatoire, au nom d'une Commission, composée de MM. Chauffard, Widal, Achard, Pierre Marie, de Lapersonne, Léon Bernard et Arnold Netter, rappotreur. (*Report of a Committee on the Etiology, Prophylaxis, and Obligatory Declaration of Lethargic Encephalitis.*) Bull. Acad. de méd., Par., 1921, **85**, 278.

The history of lethargic encephalitis is reviewed from the time of its beginning in 1916. A similar and probably identical disease was present in Italy and Hungary in 1890. In 1712 an epidemic of "Schlafkrankheit" occurred in Tübingen, and it is believed that this, as well as other diseases of a similar character occurring in medieval and ancient times, were really cases of lethargic encephalitis.

The evidence is strongly against any relationship of this disease to influenza.

Despite the fact that lethargic encephalitis usually occurs sporadically, numerous instances are cited showing that the disease is contagious. It can be contracted from patients ill or convalescent, or in the stage of incubation, and from persons not ill, but who have been in contact with cases. These latter are of course carriers.

By becoming contaminated with nasal secretions or saliva, inert objects such as linen, clothing, etc., may possibly play a minor rôle in the spread of the disease.

For prevention of the disease quarantine measures are of no avail, since the disease is so widespread. Patients should be carefully isolated, however, and as far as possible intercourse with persons caring for the patient should be avoided. Rooms, linen, and clothing of the patients should be disinfected.

The disease should be reported. On account of its protean manifestations rendering diagnosis very difficult, suspected cases should also be reported.—J. E. W.

1682. Hygiène publique et hygiène social aus État-Unis. (*Public and Social Hygiene in the United States.*) P. Armand DeLille. Rev. d'hyg., Par., 1919, **41**, 67–77.

Notes of a visit to the United States, describing the health department of New York City and New York State as models of their kind. The article also contains a tribute to the well-organized child welfare service of Cleveland. The two outstanding features of public and social hygiene in the United States are considered (1) the bodies of special sanitary police or inspectors and (2) the special educative agents, such as settlement nurses and home visitors. —J. B.

1683. De la guerre à la paix, en hygiene. (*From War to Peace in Hygiene.*) René Martial. Rev. d'hyg., Par., 1919, **41**, 189–203.

A plea for the continuance of the application of the hygienic measures instituted during the war—improvements which are characterized under the suggestive title "The Coming of Hygiene to France."—J. B.

1684. Faut-il faire un ministère de la santé publique? (*Do we need a Minister of Public Health?*) Paul Faivre. Rev. d'hyg., Par., 1919, **41**, 163–176.

A plea for the creation of a minister of public health, with the establishment of sub-bureaus in towns of 20,000 inhabitants. The plan includes organization of the laboratory phases of the work, improvement of the sanitary "laws of 1902," and public instruction as a necessary means of advancing public welfare.—J. B.

1685. Sur le projet de revision de la loi du 15 Février, 1902, sur la protection de la Santé Publique. (*On the Project for Revising the Law of February 15, 1902, for the Protection of the Public Health.*) Leon Bernard. Rev. d'hyg., Par., 1921, **43**, 97–121.

A detailed description of the defects of the 1902 law and the desired changes. Four needs are definitely cited: (1) the recognition that public health is essentially an "affair of the State;" (2) power to enforce the regulations established, the penalties of the old law, for example, being almost ludicrously insignificant; (3) adjustments designed to secure the coöperation of the physicians; and (4) new and necessary emphasis on health education.—J. B.

INDUSTRIAL HYGIENE

1686. The influence of Dust Inhalation upon the Incidence of Phthisis. Edgar L. Collis. Pub. Health, Lond., 1921, **34**, 97–104.

A restatement of the relatively low rates of phthisis among English coal miners, with the suggestion that the conditions under which coal diggers operate—at considerable distances from each other and with little personal contact—may have something to do with the supposed favorable influence attributed to coal dust. The same low tuberculosis rate applies for iron and steel workers, even though there is a high mortality as a whole among furnace men.

The author classifies dusts as inert and harmful, the majority of dusts (limestone, plaster-of-Paris, plastic clay) being inert for phthisis, although predisposing to asthma, bronchitis, and pneumonia. Silica dusts are considered harmful, ganister brick dust being associated with a heavy phthisis mortality—76 per cent of all deaths being due to tuberculosis; among such workers there is a tuberculosis mortality of 39 per 1000, as contrasted with 1.3 per 1000 for the rates of the related towns.

Where rock ripping accompanies the coal getting a higher tuberculosis rate prevails than when this is not the case. The author advances the theory that the acid material in silica, etc., sets up a reaction resulting in the formation of fibrous tissue—silicosis—making such lungs a prey to tuberculosis. The ease with which silica (like carbon) forms colloidal compounds is interfered with by the presence of acids. The lower death rates in processes where fire clay dust mixes with the silica is explained by the higher colloidal content of weathered fire clay (or fire clay mixtures) where the organic acids have been washed away, phagocytic action being related to the acid-colloidal content of the inspired dust.—J. B.

DISINFECTION AND GROWTH INHIBITION

1687. Disinfectant Testing by the Hygienic Laboratory Method. Pub. Health Rep., Wash., 1921, **36**, 1559–1564.

The present Hygienic Laboratory method of testing disinfectants, superseding in part the method described in previous publications, is discussed. A broth medium containing Armour's peptone adjusted to a reaction between pH 6.0 and 7.0 is used for growing the culture. *Bacillus typhosus* Hopkins is used as the test organism and daily transplants are made for at least 5 days before the test is made. The glassware and apparatus used are described and the method for making the dilutions and directions for carrying out the test are presented.—I. A. B.

1688. Ueber die bakterientötende Wirkung einiger Metall-Trypaflavinverbindungen. (*The Bactericidal Power of Some Metal-Trypaflavin Compounds.*) MAX BERLINER. Berl. klin. Wchnschr., 1921, **58**, 177–178.

The cadmium, copper, gold and silver salts of trypaflavin were tested for their relative streptococcidal efficiency. The chemical nature of these metal-dye complexes has not yet been studied. The streptococci were exposed for 24 hours in the incubator to the action of the metal-dye. The cadmium salt was 6 times and the gold salt 5 times as effective as the silver salt.—B. C.

WATER AND SEWAGE BACTERIOLOGY

1689. De l'influence des moyens méchaniques de brassage sur la javellisation des eaux de boisson. (*On the Influence of Mechanical Methods of Mixing on the Chlorination of Drinking Water.*) A. ORTICONI AND NEPVEUX. Rev. d'hyg., Par., 1919, **41**, 213–223.

Improvement in the mixing or distributing conditions makes possible a decrease in the chlorine dosage and the time necessary for purification. The author advises the utilization of an aspirating action obtained by using with a motor pump two Y-branches of different calibre, a large one for the water and the smaller tube for the chlorine delivery. He advises the establishment of an "index of purification" instead of merely a chemical index of the chlorine used in controlling the chlorine treatment of water.—J. B.

1690. Pollution of Streams by Waste from Cheese and Milk Factories. J. Roy. San. Inst., Lond., 1921, **41**, 274–275.

The article calls attention to the present enormous output of waste from milk and cheese factories. The objections raised are: (1) the skim-milk waste, for example, can be converted into milk powder; (2) the method of treating the rest of the sewage, as conducted by the local authorities, is detrimental to health.

It is suggested that some preliminary purification connected with the factory be followed such as natural oxidation by nitrifying bacteria after discharge over filter-beds, or irrigation over grass lands.—J. B.

FOOD BACTERIOLOGY

(*See also Numbers 1622, 1638, 1640, 1718, 1736*)

1691. Some Suggestions Concerning the Bacteriological Diagnosis of Human Botulism. K. F. MEYER AND J. C. GEIGER. Pub. Health Rep., Wash., 1921, **36**, 1313–1317.

Some experimental work on the isolation of *B. botulinus* from the organs of fatal cases and from stools is described. The organism was isolated from the jejunal wall of a case of botulism fatal on the fifth day, while spleen cultures in two other instances were negative. The organism was isolated from stool specimens in two clinical cases of botulism on the sixth, seventh and eleventh days of illness. The importance of culturing stools in suspected cases of botulism as a diagnostic aid is emphasized.—I. A. B.

1692. Direct Inoculation Test for B. botulinus Toxin. Determination of the Presence of B. botulinus Toxin by Intraperitoneal Inoculation of Laboratory Animals with Suspected Foods. I. A. BENGTSON. Pub. Health Rep., Wash., 1921, **36**, 1665–1671.

Direct intraperitoneal inoculation of mice and guinea pigs with suspected food substances is discussed as an aid to the diagnosis of cases of botulism. Experimental work carried out on mice, with artificially contaminated foods, including canned peas and corn, showed that characteristic symptoms may develop in less than one hour and death occur in as short a time as one hour and 10 minutes. The rapidity of the appearance of symptoms and occurrence of death is doubtless dependent on the amount and strength of the toxin present, and a longer time is required in proportion as the toxin is weaker or less in amount.—I. A. B.

1693. Legislative Committee Reports on Bills Enacted and Pending. Am. Food J., N. Y., 1921, **16**, 15–17.

A brief statement by titles of the bills passed or pending in the various states dealing with food, food preservation, milk standards, etc.—J. B.

HEALTH BOARD LABORATORY METHODS

1694. Laboratory Aids in the Diagnosis of Gonococcal Infections, with Special Reference to the Gonococcus Complement-Fixation Test. R. A. KILDUFF. Am. J. M. Sc., Phila., 1921, **161**, 578–584.

The importance of various laboratory examinations for the diagnosis of gonorrheal infections is pointed out. Much depends upon the technic employed, both in taking materials for examination, the laboratory methods used, and the proper interpretation of the results. The writer fully outlines a procedure to be followed for the taking and preparation of smears, and a technic of making the Gram stain. In the staining procedure he recommends the use of a concentrated iodine solution prepared by dissolving 1 gm. iodine and 2 gm. potassium iodide in 100 cc. distilled water rather than in 300 cc. as is usually done.

The gonococcus complement-fixation test is considered highly important as a diagnostic measure in certain groups of cases—those of a chronic nature and in the complications of gonorrheal origin. Statistics are given, showing the value of such tests. The reaction has a greater positive than negative value.—L. W. F.

1695. Kann das verschiedene kapilläre Steigvermögen der Bakterien in Filtrierpapier zur bakteriologischen Stuhldiagnose herangezogen werden? (Can the Difference in Capillary Rise of Bacteria in Filter Paper be Applied to Bacteriogical Stool Diagnosis?) Anton Hofmann. München. med. Wchnschr., 1921, **68**, 71–72.

The capillary rise method was compared with the Endo plate and the malachite green plate for the isolation of *Bact. typhosum* and *Bact. paratyphosum* B from artificially and naturally infected stools and was found inadequate. The fluidity and composition of the stools seemed to be factors that affected the efficiency of the capillary rise method.—B. C.

DIATHETIC AND DEFICIENCY DISEASES—VITAMINES

1696. The Supposed Importance of Vitamins in Promoting Bacterial Growth. J. W. M'Leod and G. A. Wyon. J. Path. & Bacteriol., Edinb., 1921, **24**, 205–210.

Part 1. An effort was here made to determine the relations, if any, existing between vitamines and bacterial growth, with a view to the use of bacterial growth as an index to the presence of vitamines, in research upon these substances. The basal medium used consisted of 0.4 per cent potassium acid phosphate in 2.5 per cent agar (pH 7 to 7.6), tubed in 5 cc. quantities, to which were added varying amounts of organic material, the minimal quantity giving growth (with *Staphylococcus aureus*) being recorded as follows; most of the organic substances being extracted variously in water (numbers 6, 9, 18, 19 and 20), 50 per cent alcohol (numbers 4, 5, 10 and 17), 80 per cent alcohol (numbers 1, 2, and 3), and 100 per cent alcohol (number 7):

SUBSTANCE	POTENCY P. RECIPROCAL SMALLEST PER CENT DRY WEIGHT GIVING GROWTH	AMINO ACID (A. A.)	RATIO $\frac{P.}{A. A.}$
Containing water soluble B			
Kidney, guinea pig 1	2000	3.0	667
Kidney, guinea pig 2	277	9.4	30
Kidney, ox	1000	20.8	48
Egg yolk	1385	16.8	80
Liver, guinea pig	500	10.0	50
Yeast extract (Marmite)	500	12.8	39
Yeast extract (Marmite)	500	16.3	31
Bouillon	416	10.6	40
Muscle	357	5.0	71
Bran	62	1.25	49
Milk	10	2.4	4.2
Lacking water soluble B			
Casein	3.3	5	0.7
Hydrolysed casein	200	38	5.3
Glucose	1	—	—
Glycine	5	133	0.04
Asparagine	10	—	—
Water soluble B, content uncertain			
Human serum	72	3.2	22.5
Pepsin, pig	167	11.7	14.3
Peptone	62	11.25	5.5
Mould, in phosphate solution	5000		

Comparison of the amino acid content (determined by formaldehyde titration) with potency shows that the results are not due entirely to amino acids. Moreover, nucleic acid or its congeners were thought not to explain the results since nucleic acid, uric acid, urea, caffein and alloxan gave, individually, no appreciable effect, while an acid hydrolysate of nucleic acid had a potency of only 45. Many if not most of the results recorded seem to be compatible with the vitamine hypothesis.

Part 2. An attempt was here made to determine the nature of the property of fresh blood or serum by virtue of which it promotes the growth of delicate bacteria, such as pneumococcus, and meningococcus. In addition to blood and serum, whole egg, charcoal and "marmite" were used, both heated (5–15 minutes at 100° or 20 minutes at 115°) and unheated media being employed. The percentages of organic material used were:

Blood	3-20
Serum	3-20
Whole egg	5-10
Marmite	2-5
Charcoal	Suspension-quantity not stated

The following conclusions were drawn;

1. The growth-promoting power does not bear any definite ratio to the known vitamine content, since marmite, known to be the richest in vitamines, had little or no effect, while charcoal, certainly devoid of vitamines, had quite an appreciable effect.
2. The growth-promoting power for pneumococci is to some extent destroyed by heating serum, etc., while that for meningococcus is little altered or increased.

Active tryptic or peptic digestion of these substances was found to destroy completely their power of promoting the growth of pneumococci or meningococci. Since known vitamines must pass to the body by way of the stomach and duodenum, where they are subjected to the digestive juices, it seems that they must differ in nature from the growth-promoting factor for these bacteria.

No satisfactory evidence could be obtained that the growth-promoting factor for these bacteria could be extracted with alcohol. It appeared to be a phenomenon of the colloid state. These colloids seemed to promote growth of the bacteria by abstracting from them by-products of uncertain nature (perhaps ferments), automatically inhibitory to growth.

Tryptic digests, though they fail to promote the growth of pneumococci, meningococci, and hemolytic streptococci (all inhibited by high concentrations of amino acid), do promote the growth of intestinal bacteria, which normally develop in their presence.—I. W. P.

1697. An Experimental Study of Avian Beriberi. G. Marshall Findlay. J. Path. & Bacteriol., Edinb., 1921, **24**, 175–191.

This work was undertaken for the purpose of investigating the part played in normal metabolism by vitamine B, 43 fowls and 41 pigeons being used in the experiments. Of the fowls, 12 were fed on mixed grains as controls, 15 on an exclusive diet of polished rice (70 grams per day), while 12 were given water only to compare the effects of inanition — 4 were found infected at death, with coccidiosis of the liver, *B. coli* or *B. pyocyaneus*. Of the pigeons, 15 were fed on polished rice, 12 were used as controls and 6 were given a ration of oats and maize, 10 grams of each on alternate days with $\frac{1}{10}$ the body weight of yeast every third day—8 were found infected at death with *B. coli* or *B. pyocyaneus*.

The average period elapsing before the onset of symptoms was, in uninfected fowls, 31.5 days; in pigeons, 27.2 days. The period of incubation was influenced by age, sex, diet prior to the experiment, exertion during the experiment, quantity of rice eaten during the experiment and bacterial or other infection. Age did not enter into the question here, because all the fowls and all the pigeons were about the same, the fowls three-quarters grown and the pigeons young adults. When artificial feeding is not adopted, the incubation period seems to be shorter in the male, because of its greater appetite. Since previous feeding with large quantities of vitamine B fails to prolong the period of incubation greatly, it seems probable that the tissues can store up only a limited amount of it. Forced exertion for an hour a day was found to shorten the incubation period. As a rule, the appetite decreased after the first few days, even before paralytic symptoms had appeared; it has been shown by Maurer (1907) that the incubation period is in inverse proportion to the amount of rice consumed, due perhaps to the energy expanded on digestion and metabolism. Bacterial or other infections appeared to hasten the onset of symptoms.

The main symptoms were as follows: During incubation, there was usually some diarrhea, with light-colored stools. The actual onset was usually gradual. The feathers became ruffled and the head was kept sunk between the shoulders, while in walking the tibio-tarso-metatarsal joint was held partially flexed, owing to commencing paralysis of the extensor muscles of the leg. Death usually intervened in 2 or 3 days, the bird as a rule becoming semi-comatose before it. Symptoms in detail:

1. Nervous symptoms. Paralysis first appeared in the flexor muscles of the toes, and spread upward; wing-droop was rare in pigeons. Head retraction was marked, from paralysis of the anterior neck muscles, emprosthotonos being occasionally noted. At a late stage dysphagia occurred.
2. Sensory changes. Apparently there was an impairment of the sensations of touch, temperature and pain on the legs.
3. Cerebellar disturbances. Occurred in all but 4 pigeons, though only once in a fowl. Characterized by periodic convulsions, induced by any sudden stimulation.
4. Temperature changes. On a vitamine B deficient diet the daily temperature, which in healthy birds ranges from 105°–109°F, taken in the cloaca, gradually falls to 99°, 98° or even 96°F. A curative dose of vitamine B will cause the temperature to rise again as the muscular paralysis disappears.
5. Changes in the cardiac and respiratory functions. In beriberic birds there was a progressive slowing of the respiratory rate, symptoms of air hunger frequently appearing late. There was also a marked acceleration of the heart, occasionally a slowing. Both these symptoms could be relieved by a curative dose of vitamine B.
6. Edema. Not noted in the lower extremities of any of the birds.
7. Changes in body weight. On an exclusive diet of polished rice both fowls and pigeons lost weight, the fowls in the course of the experiment 25.6 per cent of their original weight, or 1.2 per cent per day, the pigeons 29 per cent of their original weight, or 2.5 per cent per day. Often there was a rapid loss of weight shortly before death, sometimes preceding the nervous symptoms.

In fowls fed on water only death occurred on the average in 11.6 days, from inanition, but there were no clinical signs of involvement of the nervous system, progressive asthenia being the main feature. Of the pigeons fed on oats, maize and yeast 4 died at an average of 27 days, the other 2 being killed on the 35th day. No paralytic symptoms were noted, though the respiration was slowed and the temperature lowered as in fowls dying from inanition.

Post mortem, the most striking feature in the beriberic birds was the extreme atrophy of all the tissues, except in the case of the adrenals, which in both beriberi and inanition show marked hypertrophy, and the pituitary, which also in both conditions shows little or no change. Appearance of tissues:

1. Nervous system.

A. Macroscopically. The brain occasionally showed slight congestion of the meninges or of the brain substance, though it sometimes appeared a dead white. Brain substance usually soft and almost diffluent. No increase in cerebrospinal fluid. No petechia. The cord appeared normal.

B. Microscopically.

1. Nerve cells. Almost complete disappearance of the Nissl granules, which were replaced by a fine granular mass, usually placed close to the origin of the axis cylinder. Chromatolysis a little more marked than in pigeons fatigued by a long flight. Nissl granules reappeared 6–9 hours after a curative dose of vitamine B. In birds dying of inanition there was only slight evidence of chromatolysis.

2. Nerve processes. Fibers stained black with Marchi's method occurred irregularly in the cord and brain, without relation to blood vessels or lymphatics. In a few cases no degeneration could be found though there was typical paralysis.

3. Neuroglia. No overgrowth.

4. Blood vessels. Occasional congestion. Some muscular fragmentation in the smaller arteries, and in places swelling of the endothelium.

5. Peripheral nervous system. As a rule, there was degeneration in the myelin sheaths of the sciatic fibers; encountered also in 2 cases of chronic inanition in pigeons. Marchi's method showed degeneration in the vagi, as a rule; this was never encountered in cases of inanition.

6. Sympathetic system. Degenerative changes in the intestinal plexuses, and swelling and vocuolation of the ganglion cells of the adrenal.

2. Endocrine organs.

A. Adrenals. Hypertrophy is somewhat greater in the female, and occurred, though less markedly, in inanition. Macrospically, they are reddish copper in color and friable, sometimes considerably congested. Microscopically, the medullary cells are fairly normal, though many of the nuclei are large and vesicular and show loss of chromatin; there is a marked increase of lipoid material in the cortex, and the oxydase reaction of the cortical cells is increased. Following a curative dose of vitamine B, the weight of the adrenals decreases from a decrease in their lipoid content.

B. Pituitary. Little or no change, either in beriberi or inanition.

C. Thyroid. Slight atrophy in beriberi. In inanition the colloid is decreased.

D. Parathyroids. Appeared normal, except for slight atrophy of the post-branchial body.

E. Thymus. Completely atrophied and disappeared in beriberi, and in inanition, even when vitamine B was present in the diet.

F. Spleen. Marked atrophy, both in beriberi and inanition, amounting to almost ⅓ of the original weight. Appears dark red and very friable, and shows microscopically a loss of lymphoid cells, with congestion and the presence of large amounts of yellow-brown pigment.

3. Genito-urinary system.

A. Genital organs.

1. Testicles. Show shrinkage of the tubules, which are filled with cellular débris and show impairment of spermatogenesis. Similar changes seen in inanition.

2. Ovaries. Small with minute vesicles of uniform size, the membrana granulosa being composed of a single layer of epithelial cells.

B. Kidneys. Relatively little atrophy. Congestion of the intertubular capillaries with cloudy swelling of the cells of the convoluted tubules. No fatty degeneration noted.

4. Circulatory system.

A. Heart. No great hypertrophy. Right heart frequently dilated, especially the auricle. Myocardium soft and pale, frequently edematous at the auriculo-ventricular junction. Muscle cells showed cloudy swelling and frequently commencing fragmentation. The changes in inanition were very similar. Hydropericardium was encountered in 26 per cent of fowls and 20 per cent of pigeons with beriberi and in 16 per cent of fowls and 16 per cent of pigeons with inanition, and varied from one drop to 12 cc. in fowls and from one drop to 4 cc. in pigeons. It appeared to have no relationship to the size of the adrenals.

B. Blood vessels. No atheroma noted in the aorta. Microscopically, the smaller arteries showed swelling of the intima, with degenerative changes in the muscular coat of the media.

5. Alimentary tract.

A. Oesophagus. Thinning from atrophy of the muscular coat.

B. Crop. Changes similar to those in the oesophagus.

C. Glandular stomach. Atrophy of the mucosa, and thinning of the wall. Marked congestion. Disappearance of lymphoid tissue. Cessation of active secretion in the large glands and degeneration of the lining epithelium.

D. Muscular stomach. Atrophied, mucosa frequently easily detached.

E. Intestines. In beriberi the atrophy of the wall was visible grossly. Duodenum congested and ecchymosed, not noted in inanition. Microscopically, there was atrophy of the mucosa and muscularis. The lymphoid tissue had largely disappeared.

F. Liver. Dark red and friable. Gall bladder usually empty, in contrast to cases of inanition. Microscopically, there was usually marked congestion and fatty degeneration, and occasionally cloudy swelling. Many nuclei pale, swollen and vesicular. Mitoses not seen.

G. Pancreas. Considerable atrophy. Very pale. Acinar cells showed cloudy swelling, and pale, vesicular nuclei. Islets normal.

6. Muscular and osseous systems. Muscles soft, dark and atrophied, with loss of cross striations. Bones atrophied and light.

The pathogenesis of beriberi. It is pointed out that since, in addition to its lack of vitamines, polished rice is deficient in protein, fat and organic salts, while carbohydrates are present in excess, it is necessary, in order to determine the exact part played by vitamine B, to eliminate, as far as possible, the pathological changes due to these other factors. Others have shown that correction of the salt deficiency delays, but does not prevent, the onset of beriberi, while if pigeons are fed on polished rice plus an excess of the various foodstuffs, the incubation period is considerably shortened by an excess of carbohydrate, slightly shortened by an excess of protein and unaffected by an excess of fat. In the present experiments, 1 cc. of orange juice, given daily to 2 pigeons fed on polished rice, failed to modify the clinical symptoms or histological findings. Moreover, none of the birds developed the xerophthalmia said to be characteristic of a deficiency in vitamine A, nor was there any particular liability to respiratory disease. The functions of the various organs, normally, in beriberi and inanition are discussed:

1. The nervous system: that beriberi is a form of peripheral neuritis is shown to be untrue since.

a) Degeneration can be demonstrated in the nerve sheaths some days before the onset of paralysis.

b) A dose of vitamine B cures the paralysis in a few hours in birds, but does not repair the degeneration of the myelin sheath.

c) Symptoms of paralysis occur when no degeneration can be found in the myelin sheaths.

The only change constantly present in human and avian beriberi, in the central nervous system, is chromatolysis and nuclear degeneration, more marked in man. The administration of vitamine B, in birds, clears up the paralysis and causes a return of the Nissl granules, indicating that paralysis is somehow connected with their disappearance. These granules are regarded as being composed of nucleo-protein, so that the paralysis of beriberi would seem to be associated, in some way with, nuclear starvation.

2. The endocrine organs.

a. Adrenals. The hypertrophy observed here in beriberi affects chiefly the cortex. When a curative dose of vitamine B is administered to a paralytic bird, three changes occur remarkable rapidity:

(1) The paralysis disappears.
(2) The Nissl granules reappear.
(3) The lipoid content of the adrenal cortex is reduced.

The adrenal cortex appears to constitute a storehouse for phosphorised lipoid, which is passed on to the central nervous system and genital organs to help form nucleic acid. Apparently when the tissue content of vitamine B falls below a certain level, the phosphorised lipoid, instead of being passed on, is stored in the adrenal cortex, the central nervous system runs short and a functional paralysis results. If nuclear shortage becomes very marked, the medullary centers suffer and death follows, but this can be prevented if a curative dose of vitamine B is given in time. If this reasoning is correct, it is evident why muscular activity, by using up nuclear material in the central nervous system, shortens the incubation period for beriberi, while starvation, in which nuclear activity is reduced to a minimum, is not accompanied by symptoms of beriberi. Total adrenalectomy, in frogs and pigeons has been shown by others to produce progressive paralysis and death, while changes in the nerve cells of rabbits and guinea pigs have been found, especially in the medulla, the nuclei becoming vesicular, eccentric, or totally absent, changes which are interestingly similar to those of beriberi. It is pointed out that in Addison's disease fatigue is a marked symptom, and may be due not so much to the loss of adrenalin as to the insufficient supply of lipoid received from the adrenal by the nervous system.

b. Pituitary. Little or no change, either in beriberi or inanition.

c. Thyroid. Little atrophy, either in beriberi or inanition.

3. Genital organs. Show changes both in beriberi and inanition, ceasing to function whenever the central nervous system is in danger. Capable of regeneration following administration of vitamine B, in beriberi.

4. Kidneys, heart and alimentary tract. Changes similar in both beriberi and inanition, with constant nuclear degeneration in the former. Fatty degeneration in the liver is noted in relation to the complete disappearance of subcutaneous fat. Characteristic absence of mitoses in liver cells.

Biochemical experiments. An attempt was made to determine whether there was any quantitative relation between the nucleic acid content and the vitamine B content of adult tissues, the ox being chosen because the vitamine B content of its tissues has been carefully worked out. It was found that the content of vitamine B and of nucleic acid was highest in the liver, so that taking the liver content of both as 100, the following relative values obtained;

ORGAN	VALUE, VITAMINE B	NUCLEIC ACID PER KILO OF ORGAN	RELATIVE NUCLEIC ACID CONTENT
		grams	
Liver	100	36.4	100.0
Brain	75	20.1	72.2
Heart	53	15.2	50.9
Muscle	18	5.2	17.2

These findings suggest that in the adult the amount of vitamine B is proportional to the amount of nucleic acid. Further experiments were carried out on the nucleic acid content of the pigeons, organs, the brain and the liver being chosen, in normal pigeons, beriberic pigeon's and beriberic pigeons 9 hours after a curative dose of vitamine B. The following values were obtained, in grams per kilo (dry):

NUCLEIC ACID	NORMAL PIGEON	BERIBERIC PIGEON	"CURED" PIGEON
Liver	29.25	19.40	21.50
Brain	27.75	23.45	26.08

This indicates that even in the tissues of beriberic birds there should be an appreciable amount of vitamine B factor. This is further indicated by the fact that hens fed for 50 days on polished rice plus 1 gram of brain, kidney, muscle, heart or liver of a pigeon dying of beriberi all failed to contract the disease and remained in good health. All increased in weight except the one fed with liver, which lost 2.4 per cent of its original weight, and histologically none showed any evidence of beriberi. These findings show that as long as the tissues contain nucleic acid they also contain vitamine B.—I. W. P.

1698. Les extraits alcooliques de levure de bière dans la polynévrite aviaire. (*Alcoholic Extracts of Beer Yeast in Avian Polyneuritis.*) H. Penau and H. Simonnet. Compt. rend. Soc. de biol., Par., 1921, **85**, 198–200.

The antineuritis properties of alcoholic extracts of beer yeast were tested in pigeons fed upon a diet lacking the B factor. It was found that the alcoholic extracts, prepared either by extraction at 20° or at 80°C., exerted a protective effect and, within certain limits, a curative effect upon pigeons already showing the results of the dietary deficiency.—G. H. S.

1699. Vitamines and Nutrition. M. J. Lewi and H. E. Dubin. N. York State J. M., N. Y., 1921, **21**, 269–270.

A résumé of the present knowledge of the subject.—F. W. H.

CANCER RESEARCH

1700. The Neural Origin of Certain Sarcomata of the Brain. J. R. Perdrau. J. Path. & Bacteriol., Edinb., 1921, **24**, 129–136.

Two cases of brain tumor are described.

Case 1. Woman, age 37, history of pains in the head for 2 weeks and vomiting. Drowsy on admission, with pain in the left frontal and occipital regions and marked photophobia. Pulse averaged 60. Both 6th and right 7th cranial nerves paralysed, the left 7th being very weak. Partial deafness ln the right side. Pupils equal, reacting to light and accommodation. Double optic neuritis. Right hand weak. Deep and superficial reflexes normal. Spinal fluid clear but under marked pressure, cytologically normal. Diagnosis; a tumor or a hemorrhage in the region of the pons. Paralysis and coma increased and death occurred 7 days after admission. Autopsy performed about 16 hours after death. Findings: Softening of the left cerebral hemisphere. An unencapsulated tumor found in this hemisphere measuring about 5 by 4 by 4 cm., closely resembling a caseous tuberculous mass; also a small patch of softening in the right basal ganglia and slight softening of the pons. Microscopically the tumor was found to be a mixed spindle and giant-cell sarcoma, with the following characters pointing to a neural origin for the tumor cells:

1. A close resemblance to the neuroblast from their shape.
2. The presence of immature tigroid substance in their protoplasm.
3. A tendency at further development toward the ganglion cell, e.g., intracellular fibrils.
4. Early degenerative processes similar to those found in senile brains.

The tumor is therefore a true neuroblastoma of the bipolar type. The possibilities of its origin from neuroglia or from the sympathetic nervous system are discussed.

Case 2. Woman, age 64, history of 5 strokes accompanied by severe headache during the preceding 12 months, the last one 2 weeks before admission. Never became unconscious. Mild right-sided hemiplegia. Died 2 weeks after admission. Diagnosis, cerebral hemorrhage. Autopsy performed 14 hours after death, Findings: Several small hemorrhages in the subcortical area of both hemispheres, filling oval, cystic cavities. On removal of the blood each cavity was seen to contain a small tumor, which looked like shreds of clotted fibrin and was attached to the most superficial part of the cavity. In only one case had the tumor burst on the brain surface. Five of them were probably the cause of the 5 "strokes," the sixth being too small to give symptoms. There was also a tumor the size of a tangerine, white and but little hemorrhagic, in the lower part of the upper lobe of the right lung, and the medulla of the left adrenal presented a large, blood-filled cavity containing fibrin-like growths similar to those in the brain. Microscopically the tumors were all found to be identical, consisting of perivascularly arranged pear-shaped cells, the largest ones equal in size to the largest Betz cells, attached by stalks to the blood vessel walls, from which connective tissue fiber radiated between the tumor cells. Multinucleated cells and mitoses were common. Some of the large, less immature cells closely resembled the pyramidal cells of the motor cortex, and immature tigroid substance could occasionally be seen at the periphery. Axis cylinders, intracellular fibrils, myelin and glia fibrils were not seen anywhere. There was much hemorrhage, and the tumor tissue was surrounded with extravasated blood and infiltrated with leucocytes, except in the lung, where there was little hemorrhage and the connective tissue elements were well developed. More than three-fourths of the tumors as seen post mortem were found to consist of semi-clotted, extravasated blood. The growth in the left adrenal was thought to be metastatic, since a primary tumor of the adrenal would have metastasized to the mesenteric lymph nodes, liver, posterior mediastinum, ribs and skull, but never to the lungs; it was probably primary in the brain. The lack of specific neural characters can be explained by the rapid growth, the cells not being allowed time to reach a high state of maturity. The unipolar neuroblast is the type cell of this tumor.

A brief review of literature on neurocytoma of the central nervous system is given.—I. W. P.

1701. L'action de la radiothérapie sur le passage dans le sérum des albumines des tumeurs. (*The Influence of Radiotherapy upon the Passage of the Albumin of Tumors into the Serum.*) Loeper, Debray and J. Tonnet. Compt. rend. Soc. de biol., Par., 1921, **85**, 279–281.

Intensive and prolonged application of radiotherapy to inoperable tumors results in certain changes in the chemical composition of the serum. The total albumin is considerably increased (from 55 to 67.5), serine remains practically the same, and the globulin is also increased (13 to 19.8). This increase can be detected upon the second day after treatment and for some days thereafter. The amino acid content of the serum is decreased on the second day, as is the ereptic property of the serum.—G. H. S.

DISEASES OF THE BLOOD, LYMPHATICS AND DUCTLESS GLANDS

1702. Tularaemia Francis 1921. I. The Occurrence of Tularaemia in Nature as a Disease in Man. Edward Francis. Pub. Health Rep., Wash., 1921, **36**, 1731–1738.

Tularaemia is the name proposed for a specific infectious disease due to *Bacterium tularense*. The disease is transmissible from rodents to man by the bite of a blood-sucking insect or by the handling and dissection of infected animals by market men or laboratory workers. The disease in man and in jack rabbits and ground squirrels was studied by the author in Utah during the years 1919 and 1920. The symptoms and course of the disease in human cases are described. The onset is sudden, following the fly bite, and is accompanied by pains and fever. The patient becomes prostrated and the lymph glands in the vicinity of the bite become inflamed and swollen and commonly suppurate. The fever is of a septic type and lasts from 3 to 6 weeks and convalescence is slow. One fatal case has been reported.—I. A. B.

1703. Tularaemia Francis 1921. II. Experimental Transmission of Tularaemia by Flies of the Species Chrysops discalis. Edward Francis and Bruce Mayne. Pub. Health Rep., Wash., 1921, **36**, 1738–1746.

Experiments were carried out to determine whether *Chrysops discalis* (a blood-sucking fly) is capable of carrying *Bacterium tularense* infection from an infected to a healthy laboratory animal. The results of the experiments showed that specimens of *Chrysops discalis* were able to carry the infection from bitten infected guinea pigs and rabbits to healthy guinea pigs and tame rabbits. Eleven such successful transmissions were made, while 27 attempts were unsuccessful. Infected animals developed the disease and died in from 4 to 7 days. The interval between the biting of the infected animal and the biting of the healthy animal varied from a few seconds to 16 days. The longest interval which elapsed between the bite which infected the fly and the subsequent bite by which that fly infected a healthy animal was 4 days. Infected flies kept at a low temperature were killed at varying intervals and injected subcutaneously into guinea pigs. This method showed that the longest time during which such a fly remained infected was 14 days. It is probable that the virus does not multiply in *Chrysops discalis* but that this fly acts as a mechanical transmitter of the organism.—I. A. B.

1704. Tularaemia Francis 1921. III. Experimental Transmission of Tularaemia in Rabbits by the Rabbit Louse, Haemodipsvs ventricosus (Denny). EDWARD FRANCIS AND G. C. LAKE. Pub. Health Rep., Wash., 1921, **36**, 1747–1753.

The results of the experiments carried out show that the common rabbit louse, *Haemodipsus ventricosus* (Denny), when transferred from rabbits which have died of typical tularaemia to the hair of healthy animals is capable of transmitting the infection. It was shown that healthy, tame rabbits in contact with infected animals contracted the disease, 43 such positive results being obtained. A study was made of the means of transmission in these cases; the infectivity of the nasal secretions and urine, as well as transmission by the rabbit lice were considered. Transmission was successful by subcutaneous injection of nasal washings and urine but not by the feeding of these secretions. Twenty out of 29 attempts to convey the disease by the rabbit louse, however, were successful. The interval elapsing between the removal of lice from the infected animal and their transfer to the healthy animals in all the successful attempts was not more than 3 hours, with 3 exceptions, in which the intervals were 2, 3, and 3 days. The time of death following infestation varied from 8 to 26 days. The practical importance of these louse transmission experiments is that they offer an explanation of how infection is kept alive in the jack rabbits of Utah.—I. A. B.

1705. Experience with Bubonic Plague (Human and Rodent) in Galveston, 1920. MARK F. BOYD AND T. W. KEMMERER. Pub. Health Rep., Wash. 1921, **36**, 1754–1764.

A study is presented of the plague situation in Galveston during the period between June 16 and November 13, 1920, when 18 cases of human bubonic plague occurred. The correlation between the incidence of human and rodent plague during this period is graphically shown. Seventeen of the human cases were of the bubonic type and one was apparently a case of primary pneumonic plague. Eleven cases received treatment with antiplague serum and of these 6 died and 5 recovered. Of the 7 cases which did not receive antiplague serum one recovered.

0.14 per cent of 46,623 rats examined were found to be plague infected. Operations against the rodents comprised trapping, removal of rat harborages, installation of rat-proofing and fumigation of buildings and the shipping on the water front. Following these activities there was a cessation of both human and rodent plague.—I. A. B.

1006. Pernicious Anaemia and Its Treatment. SAMUEL H. HURWITZ. Calif. State. J. M., San Fran., 1920, **19**, 275.

The nature of the noxa responsible for the blood destruction in pernicious anemia is unknown. The evidence that either a chemical hemolysin or an infectious agent is the cause is inconclusive. The causative agent acts destructively not only upon the red blood corpuscles but also upon other body cells as well. The disease is accompanied by a toxic destruction of tissue protein and by metabolic changes. There is no conclusive evidence that the spleen is the site of the production of the unknown hemolytic substance. There is some foundation for the view that the function of the normal spleen is to regulate the production of erythrocytes and that splenectomy in pernicious anemia and in other diseases associated with a diseased spleen removes from action an inhibitant to bone marrow activity. More emphasis should be placed upon tests of bone marrow function. It is often possible by means of them to gain some knowledge of the presence or absence of marrow exhaustion. Little can be expected of treatment when the bone marrow is inactive or depressed. The important factors in treatment are diet and rest. Iron, arsenic are of secondary importance. Blood transfusion is a valuable emergency measure to tide the patient over a severe relapse. Splenectomy increases the average duration of life. Splenectomy increases the activity of the bone marrow, provided it does not show evidence of depression or exhaustion. All foci of infection should be eradicated wherever found.—J. R. S.

1707. Acute Suppurative Thyroiditis. P. K. GILMAN. Calif. State J. M., San Fran., 1920, **19**, 294.

An Italian laborer, 39, complained of swollen, stiff, painful neck. On admission, there was a painful, firm swelling, conforming to the shape and position of the thyroid gland. To the left of the mid-line in front, there was an area of redness on the skin beneath which existed the greatest point of tenderness and possibly fluctuation. Under a general anaesthetic, a needle and syringe revealed thick creamy pus. The cavity was opened, carefully explored, and was found to invade both lobes and isthmus, there being apparently a thin wall of gland tissue lining the capsule, this surrounding in turn more or less structureless, broken-down thyroid. Smears from the pus showed many Gram-positive, encapsulated diplococci, and a few cocci in short chains. Cultures yielded a growth of pneumococcus, Type I. The patient made an uninterrupted recovery.—J. R. S.

DISEASES OF THE CIRCULATORY SYSTEM

1708. Ueber Herzmuskelerkrankungen infolge von Pertussis. (Myocardial Disease Caused by Pertussis.) OTTO HAUSER. Berl. klin. Wchnschr., 1921, **58**, 172–174.

In acute whooping cough, the strong expiratory compression of the lungs with resulting pressure increase in the pulmonary artery may lead to dilatation and hypertrophy of the heart. Such a condition may lead to an acute cardiac insufficiency months after recovery from the pertussis infection as is shown in the case cited.—B. C.

DISEASES OF THE DIGESTIVE SYSTEM

(*See also Number 1675*)

1709. Experimental Typhoid Paratyphoid Carriers. I. K. F. Meyer. J. Infect. Dis., Chicago, 1921, **28**, 381.

This is an introductory paper to a series of publications on this general subject. The importance of the problem is outlined and its scope discussed. A list of the problems under investigation and of those proposed for future study is given.—L. C. H.

1710. Experimental Typhoid-Paratyhoid Carriers. II. The Optimum H-Ion Concentration for Typhoid Bacilli. P. Schoenholz and K. F. Meyer. J. Infect. Dis., Chicago, 1921, **28**, 384.

Stock cultures carried for some time on artificial media have a more decided optimum than recently isolated strains, suggesting an adaptation to changes in the body fluids. Optimum growth occurs at pH 6.8–7.0 in a salt-free veal infusion broth. Paratyphoid A and B have much the same range as typhoid with somewhat greater tolerance for alkali.—L. C. H.

1711. Experimental Typhoid-Paratyphoid Carriers. III. Do Carrier Strains Differ from Strains Isolated from Ordinary Typhoid Cases? C. R. Christianson, N. M. Neilson and K. F. Meyer. J. Infect. Dis., Chicago, 1921, **28**, 394.

No differences between 14 carrier strains and strains from acute cases could be consistently found. Specific elective localizing properties were not encountered.—L. C. H.

1712. Experimental Typhoid-Paratyphoid Carriers. IV. Typhoid Infections in Normal and Immunized Animals. K. F. Meyer, N. M. Neilson and M. L. Feusier. J. Infect. Dis., Chicago, 1921, **28**, 408.

The intravenous injection of small numbers of typhoid bacilli into normal rabbits is followed by their rapid removal from the circulation. The majority are found in the liver; smaller numbers in the spleen, bone-marrow and lungs; and small numbers in the lymph nodes, kidneys and other organs. Large numbers are less speedily removed from the circulation but their distribution is about the same as when smaller amounts are injected. The distribution and destruction of small or large numbers are about the same in immunized as in normal rabbits. An intravenous injection of a large dose of typhiod bacilli produces primarily a toxemia rather than a septicemia. The blood and serum of normal rabbits *in vitro* is bactericidal for typhoid and paratyphoid A bacilli but not for paratyphoid B. The serum of immunized rabbits *in vitro* is not bactericidal for either.—L. C. H.

1713. Experimental Typhoid-Paratyphoid Carriers. V. The Mechanism of Gall Bladder Infections in Laboratory Animals. K. F. Meyer, N. M. Neilson and M. L. Feusier. J. Infect. Dis., Chicago, 1921, **28**, 456.

The elimination in the bile of typhoid bacilli injected intravenously into rabbits, guinea pigs and dogs was studied by means of temporary common bile duct fistulas. More bacteria appear in the bile of normal rabbits than of immunized rabbits. The passage of the bacilli from the blood vessels to the bile capillaries is probably governed by the endothelial phagocytes. The immunization of rabbits prevents, to a certain extent, the passage of the bacilli. Rabbits immunized with dead or living bacilli and then injected with living bacilli on the sixth to the tenth day following the last immunizing dose regularly discharge more bacilli than normal controls. This is probably due to incomplete recovery of the vascular endothelium injured by the immunizing process. Complete recovery, as a rule, does not take place before the tenth day. Chronic carriers probably result from embolic, capillary invasion of the wall of the gall bladder with subsequent invasion of the bile.—L. C. H.

1714. Experimental Typhoid-Paratyphoid Carriers. VI. The Reactions and Physiology of the Bile in Animals. N. M. Neilson and K. F. Meyer. J. Infect. Dis., Chicago, 1921, **28**, 510.

The authors found a constant difference between the hepatic and cystic duct bile in all animals tested except guinea pigs. The hepatic duct bile is always alkaline to litmus. The cystic bile is influenced by the health and diet of the animal. It may have a pH from 6.4–7.7, the average being 7.2. On standing, exposed to the air, bile increases in alkalinity. Fasting and acid diets produce cystic biles of a high H-ion concentration.—L. C. H.

1715. Experimental Typhoid-Paratyphoid Carriers. VII. Bacteriostatic and Germicidal Properties of Bile. N. M. Neilson and K. F. Meyer. J. Infect. Dis., Chicago, 1921, **28**, 542.

Fresh bile is a good medium for the growth of organisms of the typhoid group. Bile on standing often acquires bactericidal properties which do not obtain in the animal body. Bile which has stood exposed to the air for some time and has acquired germicidal properties, can be made to support the growth of bacteria by saturation with CO_2 and covering with a layer of oil.—L. C. H.

1716. Experimental Typhoid-Paratyphoid Carriers. VIII. The Influence of the H-Ion Concentration on the Growth of B. typhosus in Mediums Containing Bile or Bile Salts. P. Schoenholz and K. F. Meyer. J. Infect. Dis., Chicago, 1921, **28**, 588.

At pH 7.0 bile and bile salts in concentration of 1 per cent are growth-enhancing, while at pH 8.4 the same concentrations acquire either inhibitive, bacteriostatic or germicidal properties.—L. C. H.

1717. Toxi-infection-mortelle à bacille de Morgan. Lésions de l'intestin grêle. Reproduction experimentale. (Fatal Toxic Infection Due to the Morgan Bacillus. Lesions of the Small Intestine. Experimental Reproduction.) Besson and De Laverne. Bull. Acad. de méd., Par., 1921, **85**, 260.

The authors report a case appearing to throw light upon the question of the pathogenicity of the Morgan bacillus. The patient, who had had an intense diarrhea for 2 days, died 10 hours after entering the hospital. Autopsy showed the peritoneal fluid to be increased in amount and of a hemorrhagic tint. The mesenteric lymph nodes were enlarged. The mucosa of the small intestine extending upward from the ileo-caecal valve was of an intense red color, hemorrhagic in places. The mucosa of the large intestine was healthy. There were no macroscopical lesions of the other organs.

Sections of the lesions of the small intestine showed desquamation of the epithelium and a dense lymphoid infiltration with hemorrhagic islands and vascular dilatation. This infiltration occupied the whole thickness of the mucosa.

Blood culture was negative. From the bile, the peritoneal fluid, and stool, an organism of the following characteristics was isolated: a rather short motile bacillus, not fermenting lactose, but fermenting glucose, levulose, maltose, and glycerin with gas production. It reduced slightly neutral red, did not coagulate or decolorize litmus milk, nor did it blacken lead agar. An abundance of indol was produced. On potato there was a thick growth turning black with age. Gelatin was not liquefied. There was no agglutination with paratyphoid B serum.

The organism hence presented all the characteristics of the microbe that Morgan described as Bacillus No. 1, and commonly known as the Morgan bacillus. Two cc. of a 24-hour broth culture produces diarrhea in rabbits and death in 2 days. At autopsy lesions similar to those of the fatal human case are found. No evidence of a soluble toxin has been found. On the other hand its endo-toxin is very active: a maceration of a heat killed culture kills a rabbit "on the table" in doses of 3 cc. Doses of 1 cc. produce death in about 20 hours, with diarrhea followed by paraplegia.

These observations permit one to attribute the fatal human case to an infection by the Morgan bacillus.

The action of the Morgan bacillus differs in several ways from that of the dysentery bacilli. The former attacks the small intestine, the latter the colon. The characteristics of the true dysentery syndrome such as tenesmus, mucoid and hemorrhagic stools not containing fecal matter but showing many leucocytes on microscopical examination seem to be absent in an infection due to the Morgan bacillus.—J. E. W.

1718. Étude étiologique et clinique de 118 cas de fièvre typhoïde, observès à l'hôpital Dubois du 1er. juillet, 1919, au 1er. janvier, 1921. (Etiological and Clinical Study of 118 Cases of Typhoid Fever Observed at the Dubois Hospital from July 1, 1919, to January 1, 1921.) Courtois-Suffit and F. Bourgeois. Bull. Acad. de méd., Par., 1921, **85**, 239.

The majority of the patients were strangers in Paris who developed typhoid while staying at a hotel. There were 41 men and 77 women. This is approximately the same proportion of men to women as indicated by Chauffard, and cited as supporting the efficacy of anti-typhoid vaccination.

The cases were diagnosed by the typical clinical course, and confirmed by the Widal reaction. There were 115 cases of typhoid and 3 of paratyphoid.

Thirty-five cases were attributed to oysters, since this number of patients gave a history of having recently eaten oysters. The mortality in this group attributed to oysters was 17 per cent, as compared to a mortality of 1.2 per cent of the cases not attributed to oysters. Complications were also 7 times more frequent in the cases due to oysters.

The author concludes that in view of the known high mortality of typhoid due to oysters it is of especial importance to insist upon the sanitary control of oyster beds and the regulation of their transportation and handling in order to prevent contamination before consumption.—J. E. W.

1719. The Bacteriology of the Fasting Stomach and Duodenum: An Experimental Study Based on the Findings in Thirty Dogs. P. H. Poppens. Am. J. M. Sc., Phila., 1921, **161**, 203-209.

The writer, while working with Gatewood upon the relative efficiency of various cholecystenterostomies, including cholecystogastrotomies, cholecystoduodenostomies, and cholecystocolostomies, had an opportunity to study qualitatively the flora of stomachs and duodenums of normal fasting dogs. The animals were kept on a mixed diet of bread and meat, and were not fed for 14 hours previous to the operation. Aseptic technic was employed; the opening into the stomach or bowel was made with a clean knife, and by means of a sterile pipette some of the contents was aspirated. Inoculations of 2 or 4 drops of the semi-turbid fluid were made directly into 10 cc. of a 1 per cent dextrose broth. After 8 to 12 hours' incubation, subcultures were made upon blood agar plates, dextrose agar tubes, plain agar slants (anaerobic), and litmus milk. Fishings of colonies were made from the blood agar plates and from the dextrose agar tube after 24 to 48 hours' incubation. The types of organisms isolated were tested for identification. In all, 15 animals were tested, and showed a striking uniformity in results. The duodenum showed *B. coli* 12 times out of 15, following fasting periods of 14 to 22 hours. The stomach showed this organism only 4 out of 15 times. Staphylococci, most frequently of the albus type, were found 11 out of 15 times, while the duodenum only showed the organism 3 times. Both the stomach and the duodenum showed streptococci an equal number of times (4), which was rarely. It belonged to the non-hemolytic type; no hemolytic streptococci were found. In one duodenum *Streptococcus viridans* was found in pure culture. Spore-formers were found and in most instances belonged to the *B. subtilis* group. Enterococci were found in the duodenum twice, once in pure culture, but not in the stomach.—L. W. F.

1720. Acute Infectious Enteritis with a Polyneuritic Syndrome. F. J. FARNELL AND A. H. HARRINGTON. Am. J. M. Sc., Phila., 1920, **160**, 52–61.

The writers report an epidemic of acute infectious enteritis occurring in 1917 at the State Hospital for Mental Diseases, Howard, Rhode Island. It was due to a highly toxic strain of staphylococcus which was found contaminating the milk supply. The outbreak was characterized in particular by a selective action upon the nervous system, producing in a large number of the cases a polyneuritic syndrome. As soon as the epidemic nature of the disease was recognized, 47 patients and 4 employees were quarantined. A second group of 20 showed evidence of mild or abortive attacks, all of which made a prompt recovery. Of the severe cases, several succumbed, and 4 came to autopsy. Clinical symptoms included acute gastro-intestinal disturbances, such as nausea and vomiting, frequent discharges from the bowels with mucus, and blood in some instances; the temperature ranged from 100° to as high as 104°. Great prostration with headache and backache occurred in a large number of the cases. Peripheral neuritis of more or less severity, involving either lower or upper extremities, or in some instances both, occurred in a large number of the cases. On autopsy the fatal cases showed gross lesions of an acute hemorrhagic gastritis and enteritis with small hemorrhages throughout the mucous membranes, which were deeply injected. The liver showed distinct focal necrotic areas, and in one instance advanced fatty degeneration, indicating an acute systemic infection. Small hemorrhages were found in peripheral nerves and of the mid-dorsal cord. The anterior horns showed no disturbance of the motor cells, excluding anterior poliomyelitis.

Blood cultures were made from several patients, from which a growth of staphylococcus developed in 18 hours. A similar organism was cultured from the nose, throat, and excreta. Also a growth of *Staphylococcus aureus* developed on culturing catheterized specimens of urine.

The authors point out the parallelism existing between this outbreak, and certain other infectious diseases where the virus or toxin has a selective action for the nervous system.—L. W. F.

1721. Traitement des dysenteries microbiennes par des entéro-antigènes non specifiques. (*The Treatment of Bacillary Dysentery with non-specific Antigens.*) J. DANYSZ. Presse méd., Par., 1921, **29**, 262.

A series of clinical enteritides in Poland were treated with remarkable success by rectal infusions of a heat-killed vaccine of representative types of the normal human intestinal flora. Subcutaneous or oral administration is also effective. The results are attributed in part to increased bile-flow, neutralizing toxins and ferments; in part, to a general endocrine readjustment, which has been evoked by similar therapy in many other conditions. The rôle of the normal flora in regulating endocrine balance demands further study.—L. A. K.

1722. Erwiderung Aschoff's Aufsatz "Müssen wir unsere Anschauungen über die Aetiologie der Wurmfortsatzentzündung ändern?" (*Reply to Aschoff's Article: "Must We Change our Views as to the Etiology of Appendicitis?"*) RHEINDORF. Berl. klin. Wchnschr., 1921, **57**, 106–110; 131–135.

It is difficult to find sections of the appendix which do not show evidences of helminth infestation. Signs of epithelial regeneration in the mucosa are taken to indicate damage produced by *oxyuris*, and not traumatic damage.—B. C.

1723. Spirochaeten im Darmkanal. (*Spirochetes in the Intestinal Canal.*) J. W. LANGENDÖRFER AND PETERS. München. med. Wchnschr., 1921, **68**, 12–13.

In the case described, the bloody stools of the patient contained numerous spirochetes. These were stained with aqueous fuchsin, carbol fuchsin or methylene blue and showed 6 to 8 rather steep spirals. They appear quite motile in the dark field, but are not flexible. Attempts to cultivate the organism were unsuccessful. The Wassermann reaction was negative, but treatment with salvarsan resulted in cure.—B. C.

DISEASES OF THE GENITO–URINARY SYSTEM

(See also Numbers 1617, 1623, 1694, 1745, 1769, 1772, 1776, 1782, 1798, 1819, 1823, 1829, 1832)

1724. The Fourth Venereal Disease, Ulcerative and Gangrenous Balanoposthitis: With Case Report. W. M. Donovan. Am. J. M. Sc., Phila., 1921, **161**, 267–271.

Donovan considers the so-called "fourth venereal disease" as a definite disease entity, and cites in support of his position the observations and opinions of others. The disease manifests itself as a specific ulcerative and gangrenous balano-posthitis. It is infectious in nature, venereal, and is inoculable and autoinoculable. Both a fusiform bacillus and a spirochete are found in the lesion, which morphologically resemble those types found in Vincent's angina, noma, etc., but as yet it is unknown whether they are identical or not. The author states that "the vibrio (bacillus) is anaerobic, Gram-positive, 2 μ long, by 8 μ wide, with pointed ends. It can be cultivated on serum agar. The spirochete also is anaerobic, Gram-negative, 6 to 30 μ long, by 2 μ wide. Its curves are not acute and its motility is great as observed in the dark field. The ends terminate in the center of the spiral." As an aid in diagnosis of the condition, he recommends examination of pus from the lesion, with the demonstration of the presence of both the characteristic vibrio and spirochete,—"the combination of the two is pathognomonic." Besides the etiology, the writer discusses the frequency of the disease, its history, pathology, symptomatology, diagnosis and treatment.—L. W. F.

1725. A Case of Urethral Myiasis. N. Leon. J. Parasitol., Urbana, Ill., 1921, **7**, 184–185.

A young man brought 11 normal larvae of *Musca domestica* about 6 mm. long, which he said he had passed with urine. Subsequently in the presence of the author he evacuated 8 fly larvae resembling in every respect those which he had brought in alcohol.

The man had been accustomed to sleep at night without pajamas, covered only by a sheet which he threw aside at times on account of the extreme heat. He had suffered from blennorhagia some time previously and the slight discharge still present had been sufficient to attract the flies. It is believed that they deposited their eggs in the neighborhood of the urinary meatus, and larvae had penetrated into the urethra and perhaps even into the bladder.—W. A. R.

1726. Examen ultramicroscpique du plasma sanguin citrate. (Ultra-microscopic Examination of Citrated Blood Plasma.) P.-I. Elizalde, D. Vivoli and F. Martinez. Compt. rend. Soc. de biol., Par., 1921, **85**, 318–320.

In the citrated plasma of syphilitic individuals certain bodies of unknown significance were noted under dark-field examination. The bodies are of diverse forms and apparently undergo change in morphology as the plasma ages. The bodies described are of the following classes: (*1*) Round or oval bodies with 3 or 4 brilliant corpuscular bodies and a vacuole at either extremity; without flagella. (*2*) Bodies of a racquet shape, of very variable form, with a corpuscle at each end; slowly motile, moving by rotation or longitudinal contractions. (*3*) Curved bodies, sometimes almost filamentous, 10 to 12 μ long, or shorter and of almost spherical contour, with projections. (*4*) Spherical or ovoid bodies, varying in size from 4 to 11 μ; with irregular margins, appearing as rosettes. These forms later segment into minute (1 μ) fragments with two highly refractile corpuscles. They show an irregular motility. (*5*) Some of the bodies of this last class (Type 4) develop flagella, from 0.5 to 1μ in length, terminating in a very brilliant corpuscle. These flagella undulate and finally detach themselves and show active motility. The nature and significance of these bodies is open to question.—G. H. S.

1727. Zur Aetiologie der sog. Kriegsnephritis. (The Etiology of the So-called War Nephritis.) J. Grober and R. Kaden. München. med. Wchnschr., 1921, **68**, 99–100.

The conclusions are based on 794 detailed case reports from the 10th German Army from November, 1915, to August, 1916. Adults over 35 years old were chiefly represented. Officers were rarely affected. The infantry supplied 62 per cent of the sick and the cavalry only 2 per cent. The men were exposed to damp, dark living conditions with extremes of temperature variarion. Many of them were vermin-covered. The clinical picture of the disease indicates that it is the end result of a streptococcus infection. Two of the cases closely studied at autopsy confirm this view.—B. C.

1728. Eine intrakutane Provokationmethode bei der Weiblichen Gonorrhöe. (An Intracutaneous Provocation Test in Female Gonorrhea.) Hans Nevermann. München. med. Wchnschr., 1921, **68**, 141–142.

Smears from the urethra and cervix were compared before and after provocative injection with aolan. In healthy persons there was no change. In those with gonorrheal disease there occurred an increase in the numbers of gonococci though there never occurred an increase in secretion as is found in males. The general condition of the patients was not affected by the provocative treatment.—B. C.

1729. Experimentelle Beiträge zur Syphilisprophylaxe. (Experimental Studies in Syphilis Prophylaxis.) Werner Worms. Berl. klin. Wchnschr., 1921, **58**, 103–106.

A general review is given of the studies on syphilis prophylaxis. The recent experiments on the natural syphilis of rabbits have given useful information.—B. C.

1730. Ueber das Misslingen von Abortivkuren bei primärer seronegativer Lues. (The Failure of Abortive Treatment in Primary Sero-negative Syphilis.) W. **Kerl.** München. med. Wchnschr., 1921, **68,** 42–43.

Failure may be due to the survival of spirochetes in the sclerosed tissue of the primary ulcer.—B. C.

1731. Zur Frage der Lues latens. (The Problem of Latent Syphilis.) **Martin Friedmann.** Berl. klin. Wchnschr., 1921, **58,** 227–228.

A case is described in which latent syphilis was discovered after the patient had undergone a presumably thorough treatment.—B. C.

1732. Zur Behandlung angeborener Syphilis bei besonders hartnäckigen Verlauf. (The Treatment of Congenital Syphilis of Very Stubborn Course.) **Helene Brüning.** Berl. klin. Wchnschr., 1921, **58,** 276–277.

Three cases are cited in detail. The main feature in the treatment is the institution of a course of prophylactic medication after the Wassermann reaction has become negative, followed by a provocative injection of neosalvarsan.—B. C.

DISEASES OF THE LOCOMOTOR SYSTEM

1733. Experimental Chronic Suppurative Arthritis. J. W. **McMeans.** Am. J. M. Sc., Phila., 1920, **160,** 417–423.

The author, in a study on the possible elective affinity (following localisation source) of an organism in experimental animals, injected a series of 34 rabbits with a single strain of streptococcus. The organism was isolated from the pus of an abscess in the submaxillary gland of a patient who died 8 days later of pneumonia. No post mortem examination was made, but during life no clinical evidence of bone or joint involvement existed. The streptococcus on culture grew mostly in chains of 5 or 6, but at times as many as 10 organisms without any tendency to diplo arrangement were seen. Its colonies produced a surrounding clear zone of hemolysis when grown on blood agar, and by fermentation tests it was grouped in the class of *Streptococcus pyogenes* (Holman). The injections included variable doses, single or repeated, from the freshly isolated culture, and after prolonged artificial cultivation (3 months), also after animal passage of the strain. The symptoms exhibited by the animals following the injections were comparatively mild, and no marked disturbance occurred until after a period of several days or at times several weeks. This appeared in particular as an involvement of the joints, which consisted of a suppurative process characterized by more or less distension of the capsule with a creamy sticky fluid. The organism was recovered in all instances from the pus. Among the animals which died, the time period varied greatly, i. e., from 3 to 87 days. Others were killed at different periods after receiving their injections. Autopsies were made on all, and the pathological findings fully noted and recorded in the report. It was concluded from the investigation that the strain of streptococcus which was used for experimental purposes possessed a fairly low pathogenicity for rabbits with a rather high invasive quality, and in particular it showed an elective affinity for the joints, producing a chronic suppurative arthritis. In an appreciable number of instances certain other tissues of the animal were involved, although the joints were chiefly attacked. This property was retained by the organism even after 3 months of artificial cultivation.—L. W. F.

1734. Untersuchungen in der Erkältungsfrage. III. Ueber den Rheumatismus, insbesondere den Muskelrheumatismus. (Studies on the Cold Problem. III. Rheumatism, especially Muscular Rheumatism.) G. **Schade.** München. med. Wchnschr., 1921, **68,** 95–99.

Muscular rheumatism is shown to have a relation to the prevailing weather and on this basis should be included as a complex in the process of "catching cold."—B. C.

1735. Zur Kasuistik der Wirbelkörperosteomyelitis. (A Case of Vertebral Osteomyelitis.) **Kurt Wohlgemuth.** Berl. klin. Wchnschr., 1921, **58,** 32.

The correct diagnosis was not determined until necropsy. *Streptococcus hemolyticus* and *B. proteus* were found in the pus.—B. C.

DISEASES OF THE NERVOUS SYSTEM

(See also Numbers 1618, 1681, 1720, 1799)

1736. The Difficulty in Making Differential Diagnosis between Encepehalitis Lethargica and Botulism. Pub. Health Rep., Wash., 1921, **36,** 1663–1665.

Attention is called to the difficulty of proper differentation between cases of encephalitis lethargica and botulism. Recent reports in the public press and in medical literature that many cases of encephalitis lethargica are really botulism caused by preserved food must be considered incorrect. A case resembling encephalitis lethargica, which was proved to be botulism, is described. The B type of *Bacillus botulinus* was isolated from the medulla of the patient.—I. A. B.

1737. Conception étiologique de l'encéphalite épidémique. (*Etiologic Conception of Epidemic Encephalitis.*) C. Levaditi, P. Harvier and S. Nicolau. Compt. rend. Soc. de biol., Par., 1921, **85**, 213–216.

The relationship of the virus of lethargic encephalitis to the salivary virus, to the virus of healthy carriers and to the virus of herpes is discussed. The virus from the saliva of healthy persons at most induces a keratitis when inoculated into the cornea of the rabbit; it never causes a fatal encephalitic infection. The virus itself seems to be a part of the saliva, since it is not to be found in the secretion taken directly from the salivary gland. It resists glycerol and is filtrable. Continued passage from cornea to cornea is attended with loss of virulence. The virus from the saliva of carriers of encephalitis differs from the preceding in that by corneal inoculation it can be transmitted indefinitely and induces not only a keratitis but also an encephalitis. The herpes virus (Löwenstein, Doerr and Vöchting, Blanc and Caminopetros) can not be differentiated from that of encephalitis; although the strains of herpetic origin appear to show less virulence.

Experimentally these different types of virus appear to be of the same nature, differing in virulence or in affinities. The salivary virus (from healthy persons) can be used to vaccinate against itself, or against a strain of less virulence but not against a more virulent strain, as a "carrier" strain, an herpetic strain, or an encephalitogenic strain. Certain exceptions to this rule are important as establishing the relationships between these different viruses. In two instances the salivary virus has conferred immunity against all types of virus. The virus from healthy encephalitic carriers is simply a less virulent type of the encephalitogenic virus. A crossed immunity is manifested beteeen the herpetic virus and the "carrier" virus or the fixed virus of encephalitis.

It thus appears that the virus of encephalitis exists in at least two forms; an attenuated and a fully virulent form, with intermediary forms of varied virulence. The attenuated form is almost exclusively epitheliotropic. The virulent form is also neurotropic. By repeated passage the epitheliotropic type can be converted into the neurotropic type. Thus, encephalitis is due to a virus which already exists in the saliva in forms less virulent and which under ordinary conditions causes such lesions as characterise herpes or herpetic angina. For some reason such strains acquire virulence, become neurotropic, and produce the lesions and clinical manifestations of epidemic encephalitis.—G. H. S.

1738. L'affinité cutanée du virus encéphalitique. (*Affinity of the Encephalitic Virus for Cutaneous Tissue.*) C. Levaditi, P. Harvier and S. Nicolau. Compt. rend. Soc. de biol., Par., 1912, **85**, 287–288.

Certain of the characteristics of the encephalitic virus suggest that on the one hand it is related to the virus of herpes, and on the other that it possesses some of the features of such viruses as those of vaccinia, rabies and poliomyelitis. Thus, it would seem that it should possess the property of causing cutaneous infection. Experimentally, in the rabbit, such cutaneous inoculation is followed by the development of a papular dermatitis. The virus can be demonstrated in the material from such lesions and after an incubation period the neurotropic capacity of the virus asserts itself and a typical encephalitis, with death of the rabbit, occurs. This sequence of infection takes place not only with the fixed virus from clinical encephalitis but also with the virus from the saliva of carriers.—G. H. S.

1739. Réponse aux réflexions de A. Netter à propos de notre note du 25 juin 1921: "Preuves de l'existence de porteurs sains de virus encéphalitique.:" (*Reply to Criticisms of Netter Regarding the Note on "Proofs of the Existence of Healthy Carriers of the Virus of Encephalitis."*) C. Laveditti, P. Harvier and S. Nicolau. Compt. rend. Soc. de biol., Par., 1921, **85**, 195–197.

A reply to Netter. Additional evidence of the infectivity of the saliva in epidemic encephalitis is presented.—G. H. S.

1740. Epidemic Encephalitis: Including a Review of 115 American Cases. A. D. Dunn and F. W. Heagey. Am. J. M. Sc., Phila., 1920, **160**, 568–582.

A full review of the etiology, pathology, symptomatology, prognosis and treatment of epidemic encephalitis, based upon a study of 115 cases, including 15 personal cases, has been made by the writers. They state that the cause of the disease is unknown, but discuss the various investigations as reported by different workers upon the subject. An extensive bibliography is appended.—L. W. F.

1741. Zur Differentialdiagnose der Encephalitis epidemica. (*The Differential Diagnosis of Epidemic Encephalitis.*) Herzog. Berl. klin. Wchnschr., 1921, **58**, 228–230.

A discussion is given of the clinical manifestations of the disease.—B. C.

1742. Recovery from Rabies, with Reports of Cases of Treatment Paralysis and of Recovery of Animals Apparently Rabid. J. McI. Phillips, F. Berry and J. H. Snook. J. Infect. Dis., Chicago, 1921, **29**, 97–108.

The authors present case reports of rabies in man and in animals, seeming to show that rabies is not invariably fatal, and that spontaneous recoveries, though rare, do occur, They are also inclined to believe that many cases of paralysis occurring during treatment are not due to the injections of the fixed virus but are due to the original exposure and infection for which the treatment is instituted.—L. C. H.

1743. *Störung der Blasenfunktion als Hauptsymptom der Encephalitis epidemica.* (*Disturbance of Bladder Function as Chief Symptom of Epidemic Encephalitis.*) ALFRED PFEIFFER. Berl. klin. Wchnschr., 1921, **58**, 131–132.

A dominating symptom in the disease is the disturbance in the bladder function.—B. C.

1744. *Ueber Paralysis agitans-ähnliche Krankheitsbilder* (*Linsenkernsyndrome*) *durch Encephalitis epidemica.* (*Paralysis Agitans-like Symptoms* (*Lenticular Nucleus Syndrome*) *Caused by Epidemic Encephalitis.*) ERNST SCHULTZE. Berl. klin. Wchnschr., 1921, **58**, 245–249.

A detailed summary is given of the clinical observations in 15 cases in which symptoms of paralysis agitans were most pronounced. The pathogenesis of the disease is obscure, but it is believed to be a form of epidemic encephalitis because the lenticular nucleus is involved.—B. C.

1745. *Zur Therapie der Syphilis des Zentralnervensystems.* (*Therapy of Syphilis of the Central Nervous System.*) GERTRUD HAMMERSTEIN. Berl. klin. Wchnschr., 1921, **58**, 199–200.

A detailed analysis is given of the results secured with different modes of treatment.—B. C.

DISEASES OF THE RESPIRATORY SYSTEM

(*Except Influenza and Tuberculosis*)

1746. *Sur onze cas de bronchite sanglante* (*maladie de Castellani*) *à association fuso-spirillaire de Vincent.* (*Eleven Cases of Hemorrhagic Bronchitis* (*Castellani's Disease*) *in Association with the Fuso-spirillum of Vincent.*) LÉOPOLD ROBERT. Compt. rend. Soc. de biol., Par., 1921, **85**, 230–231.

Eleven cases, 8 males, 3 females, are reported from among the Siamese and Chinese inhabitants of Bangkok. In 5 of the cases tuberculosis was also present. The sputum examined by the dark-field method shows a very polymorphic, actively motile spirochete. The organisms vary in length from 5 to 25 μ. The short forms, about 3 μ, described by Delamere were not encountered. The majority of the organisms measure 7 to 15 μ. Granular forms (when stained with gentian violet were rarely found, and agglutination masses were infrequent. After Ziehl staining a structure, apparently a flagellum, was seen at one end of the spirillum. The number of coils varied greatly; those with 2 coils constituting 2 per cent; 3 coils, 50 per cent; 4 coils, 34 per cent; 5 coils, 8 per cent; 6 coils, 4 per cent; and 7 coils, 2 per cent of the total number. The fusiform bacilli found in association with the spirilla were without motility. After staining three types could be detected: (*a*) short forms, 4 to 8 μ in length, easily stained and apparently homogenous; (*b*) longer forms, 8 to 15 μ, straight or curved, some staining inequally, others homogenous; and (*c*) forms resembling the last but longer than 15 μ.—G. H. S.

1747. *Sur le rôle de l'association a fuso-spirochètes de Vincent dans l'étiologie de la bronchite sanglante de Castellani.* (*The Association of the Fuso-spirillum of Vincent to Hemorrhagic Bronchitis* (*Castellani*).) LÉOPOLD ROBERT. Compt. rend. Soc. de biol., Par., 1921, **85**, 285–286.

The constant association of *B. fusiformis* and *Spirocheta vincenti* with hemorrhagic bronchitis suggests that these organisms may play some rôle in the causation of the disease.—G. H. S.

1748. *Bacteriologic Studies of the Upper Respiratory Passages. I. Hemolytic Streptococci of the Adenoids.* I. PILOT AND S. J. PEARLMAN. J. Infect. Dis., Chicago, 1921, **29**, 47–50.

Cultures of 103 adenoids after excision showed hemolytic streptococci in about 60 per cent, a slightly lower percentage from the surfaces and a slightly higher from the depths of the adenoids. In 25 cases where swab cultures were taken before removal and the adenoids cultured after removal, 10 or 40 per cent were positive for hemolytic streptococci by the swab method and 15 or 60 per cent were positive on culture of the adenoid after removal.—L. C. H.

1749. *Bacteriologic Studies of the Upper Respiratory Passages. II. The Pneumococci and Non-hemolytic Streptococci of the Adenoids and Tonsils.* I. PILOT AND S. J. PEARLMAN. J. Infect. Dis., Chicago, 1921, **29**, 51–54.

Cultures were made of excised tonsils and adenoids on both streaked and poured blood agar plates for the presence of the above organisms. 103 adenoids and 21 tonsils were examined. 65 per cent were found positive for pneumococci and 89 per cent for *S. viridans*. Of the 67 strains of pneumococci isolated, none was agglutinated by Type I serum, 2 by Type II and 10 by Type III.—L. C. H.

1750. Bacteriologic Studies of the Upper Respiratory Passage. III. The Influenza Bacilli (Pfeiffer) of the Adenoids and Tonsils. I. Pilot and S. J. Pearlman. J. Infect. Dis., Chicago, 1921, **29**, 55–58.

Cultures of 115 adenoids were made after removal. In 25, swab cultures were also made immediately before operation, for purposes of comparison. Blood agar and "chocolate" blood media were used. On the "chocolate" plates Pfeiffer's bacillus was found in 47 or 40.8 per cent of the adenoids and in the tonsils in 62 or 53.9 per cent. In the nasopharyngeal swabs the presence of this organism was noted in 10 or 40 per cent. In each instance where the adenoids were positive the tonsils were also positive.—L. C. H.

1751. Bacteriologic Studies of the Upper Respiratory Passages. IV. The Incidence of Pneumococci, Hemolytic Streptococci and Influenza Bacilli (Pfeiffer) in the Nasopharynx of Tonsillectomized and Non-tonsillectomized Children. J. Myer, I. Pilot and S. J. Pearlman. J. Infect. Dis., Chicago, 1921, **29**, 59–61.

Of 49 children whose tonsils had been removed 32.5 per cent showed pneumococci, 40.8 per cent of 27 children showed hemolytic streptococci and 26.5 per cent of 29 children gave a positive culture for influenza bacilli. Of non-tonsillectomized children, 32.3 per cent of 68 individuals gave positive cultures for pneumococci, 60 per cent of 40 children were positive for hemolytic streptococci and 37 per cent of 35 children gave cultures of influenza bacillus. In the positive cultures of the tonsillectomized children the numbers of the colonies of the different organisms studied were, as a rule, fewer than in the cultures of those whose tonsils had been removed.—L. C. H.

1752. Bacteriologic Studies of the Upper Respiratory Passages. V. The Diphtheria Bacilli and the Diphtheroids of the Adenoids and Tonsils. Isadore Pilot. J. Infect. Dis., Chicago, 1921, **29**, 62–66.

Altogether 100 adenoids and 100 pairs of tonsils were studied. Cultures were made in from 1–3 hours after the operation. Slants of Loeffler medium were used and the cultures examined at the end of 18–24 hours' incubation. Diphtheria bacilli were recovered in 12 instances. In 5 cases the bacilli occurred in one tonsil and not in the other. In all instances where bacilli were present they were found in the adenoids as well as the tonsils. These 12 cultures were morphologically characteristic and gave characteristic results in the different sugar media. Only 3 strains were typically virulent. Three other strains caused local reactions. The remaining 6 caused no lesions. This high percentage (12 per cent) among normal individuals, according to the author, is a further evidence of the unreliability of swab cultures in obtaining a true index of the nasopharyngeal flora.—L. C. H.

1753. Pneumonia at a Base Hospital, 1918–19. H. J. John. Am. J. M. Sc., Phila., 1920, **160**, 244–258.

The author analyses 137 cases which were admitted to his service with pneumonia during the influenza epidemic. Various bacteriological studies were included in the study; the findings from different sources such as sputa, throat swabs, blood cultures, are given. In particular the different groups of pneumococci, as well as date concerning the incidence of *Streptococcus hemolyticus*, influenza bacillus and *Micrococcus catarrhalis*, are tabulated. The paper includes considerable clinical data.—L. W. F.

1754. Zur Frage der Lungensyphilis, sowie einige Bemerkungen über Silbersalvarsan und Sulfoxylat. (The Problem of Pulmonary Syphilis, and Some Remarks on Silver Salvarsan and Sulfoxylate.) W. Arnoldi. Berl. klin. Wchnschr., 1921, **58**, 29–30.

Pulmonary syphilis may be definitely distinguished from tuberculosis by the Wassermann reaction and the response to specific treatment only. Three cases are cited. Silver salvarsan and sulfoxylate have both been found useful in the treatment of syphilis.—B. C.

INFLUENZA

1755. Observations on the Latest (1920) Recrudescence of Influenza: A Detailed Clinical Study of 100 Consecutive Cases. M. E. Alexander and E. L. MacDonald. Am. J. M. Sc., Phila., 1920, **160**, 674–687.

Besides a record of the clinical features of the late epidemic of influenza in Waterbury, Conn., the authors present the bacteriological findings in their series of cases. Throat smears were taken in 73 cases, of which 57.5 per cent showed the influenza bacillus, associated in a majority of the cases with the pneumococcus, streptococcus, and *Micrococcus catarrhalis*. In the pneumonia cases the influenza bacillus was present in 45.7 per cent of the cases examined, again associated with other organisms.

The sputum of 78 patients was examined for *B. influenzae* which was found in 62.8 per cent of these cases. In 41 pneumonia patients the influenza bacillus was isolated from the sputum in 63.4 per cent of the cases. Pneumococci were found in 23 of these instances. The influenza bacillus was isolated in 60 per cent of cases uncomplicated by pneumonia (37 cases) showing that its frequency was about the same as with the pneumonia complications. Pneumococcus grouping in 30 of the pneumonia cases gave the following results:

	NUMBER	PER CENT
Group I	2	6.65
Group II	11	36.80
Group IIA	2	6.65
Group III	7	23.30
Group IV	8	26.60
	30	100.00

Group precipitins in the urine on 25 of the pneumonia cases gave the following results:

	NUMBER	PER CENT
Group I	1	4.0
Group II	8	32.0
Group III	5	20.0
Group IV	0	0.0
Negative	11	44.0
	25	100.0

The authors report other laboratory results (blood, urine) as well as the clinical aspects of the series.—L. W. F.

1756. Influenza. C. Frothingham. Am. J. M. Sc., Phila., 1921, **161**, 528–539.
In a general review of the pandemic disease, known as influenza, occurring in 1918 throughout the United States, Frothingham discusses the more important papers on the etiology of the disease. The relationship of the influenza bacillus to the condition as compared to other types of bacteria is considered especially. But no definite conclusion is drawn in favor of any particular organism as being the specific etiological agent. The epidemiology, the pathology with its complications by secondary invaders, and the clinical conditions are fully considered. Bacterial vaccines as a prophylactic measure, also in treatment, are discussed.—L. W. F.

1757. Nature et modes d'action de l'agent pathogène infectieux de la grippe ou influenza. (*Nature and Method of Action of the Pathogenic Infectious Agent of Gripps or Influenza.*) B. Roussy. Rev. d'hyg., Par., 1919, **41**, 104–116.
The writer explains contagion as due to (1) the secretions of the respiratory tract, and (2) infected air. He believes the causal agent to be smaller than known microbes, extremely toxic, and ascribes to it a physical state so fine that it is more like that of a vapor or gas.—J. B.

TUBERCULOSIS

(*See also Numbers 1686, 1771, 1815, 1816, 1886*)

1758. The Tonsillar Route of Infection in Pulmonary Tuberculosis. James Gerrit Van Zwaluwenburg and G. P. Grabfield. Am. Rev. Tuberc., Balt., 1921, **5**, 57–64.
"A shadow that we believe represents a thickening of the pleura over the apex of the lung has been described and its relationship to tonsillar and cervical gland tuberculosis has been studied.

"Such an apical pleuritis is seen in at least 10 per cent of all X-ray examinations of the chest coming to the University Hospital laboratory.

"Such apical pleuritis occurs most frequently in cases showing tuberculous deposits in the faucial tonsils (93 per cent).

"With the cervical gland tuberculosis this lesion is recognizable in 59 per cent of all cases and probably occurs in a larger number, being obscured by the shadows of pulmonary tuberculosis, 71 per cent in this group showing either this lesion or frank tuberculosis of the lung or both.

"Cases without tuberculosis of the tonsil show an apical pleuritis in only 11 per cent of the cases.

"It is suggested that a common route of infection may lie through the tonsil and cervical lymphatics to the apical pleura and thence into the lung. If this hypothesis is accepted it offers a singularly satisfactory explanation for the frequency of apical lesions, the predominance of right-sided lesions, of the pathogenesis of tuberculous pleurisy with effusion and other obscure features of this infection."—T. G. H.

1759. Stéapsine humaine anti-huile d'olive provoquée par le vaccin tuberculeux a l'huile d'olive. (*Anti-olive Oil Steapsin Induced by an Olive Oil Lipo-tuberculous Vaccine.*) S. Marbais. Compt. rend. Soc. de biol., Par., 1921, **85**, 288–290.

When an olive oil tuberculous lipovaccine is used in the therapy of cases of human tuberculosis two types of antibodies are engendered; one antibody being the specific tuberculous antibody, the other being a nonspecific anti-olive oil antibody. Titrations of normal human serum show that there is normally present a small amount of steapsin which will emulsify a minimal amount of olive oil. In cases where the lipovaccine has been administered this amount of steapsin is increased.—G. H. S.

1760. Abaissement de la teneur en anticorps tuberculeux du sérum des malades sous l'influence des injections sous-cutanées d'oxygene. (*Reduction in the Amount of Tuberculosis Antibody in the Serum of Cases of Tuberculosis Treated by the Subcutaneous Injection of Oxygen.*) P. Armand-Delille, Hillemand and Lestoquoy. Compt. rend. Soc. de biol., Par., 1921, **85**, 307–309.

The administration of oxygen in 27 cases of tuberculosis caused a reduction in the number of units of complement of the serum in 19 of the cases, an increase in 6 cases, and no change in two cases. In some cases the decrease was very considerable; from 33.33 units per cc. to 6.66.—G. H. S.

1761. Einige Besonderheiten im Verlauf der Phthisis pulmonum unter der jetzigen abnormen Verhältnissen. (*Some Pecularities in the Course of Pulmonary Tuberculosis under Present Abnormal Conditions.*) Robert Güterbock. Berl. klin. Wchnschr., 1921, **58**, 232–233.

The vital functions of the pulmonary parenchymal cells are affected by undernourishment so that the lungs acquire a marked predisposition to disease. The disease picture of pulmonary tuberculosis seems to have become very different because of this state of affairs.—B. C.

1762. Einige Erfahrungen über tuberkulöse Erkrankung der Leistendrüsen bei intra-abdominaler Tuberkulose und die Möglichkeit ihrer Verwendung zu diagnostischen Zwecken. (*Tuberculous Infection of the Inguinal Glands in Intra-abdominal Tuberculosis, and the Possibility of its Application to Diagnostic Purposes.*) E. Mathias. Berl. klin. Wchnschr., 1921, **58**, 52–53.

In doubtful cases of abdominal tuberculosis, it is suggested that one or more of the inguinal glands be removed from the ileo-cecal region and subjected to histological examination. This procedure is, however, not without danger.—B. C.

1763. Die Behandlung chirurgischer Tuberkulosen. (*The Treatment of Surgical Tuberculosis.*) R. Haecker. München. med. Wchnschr., 1921, **68**, 18–21.

The essential consideration is to apply a "strengthening" therapy. There is no specific for tuberculosis.—B. C.

DISEASES OF CHILDREN

(*See also Number 1673*)

1764. Whooping-Cough Contracted at the Time of Birth, with Report of Two Cases. J. Phillips. Am. J. M. Sc., Phila., 1921, **161**, 163–165.

Phillips reports 2 cases of babies who contracted whooping cough at the time of birth. In each instance the same obstetrical nurse was employed, and she was suffering from a cough which she did not consider of sufficient severity to report to the obstetrician. Later, the cough steadily grew worse, and was recognized as a case of whooping cough. The author calls attention to the importance of recognizing the nature of such coughs in nurses, and excluding them from obstetrical cases during the attack. A brief review of the literature on congenital whooping cough in infants is given.—L. W. F.

1765. Silbersalvarsan bei Säuglingen mit kongenitaler Lues. (*Silver Salvarsan in Infants with Congenital Syphilis.*) Emil Mengert. München. med. Wchnschr., 1921, **68**, 13–14.

This is a preliminary report on the use of silver salvarsan in infants.—B. C.

GYNECOLOGY AND OBSTETRICS

(*See also Number 1789*)

1766. Die Bedeutung der Blutsedimentierungsreaktion nach Fahraeus für die Geburtshilfe und Gynäkologie. (*The Importance of the Blood Sedimentation Test of Fahraeus in Obstetrics and Gynecology.*) F. Geppert. Berl. klin. Wchnschr., 1921, **58**, 226–227.

The red cell sedimentation test for pregnancy begins to become reliable at a time when other phenomena make it superfluous. It is, however, of some value in the differentiation from tumor formation and certain other complications. A negative reaction is of practical utility in determining the time for operative intervention in pelvic diseases, for it indicates absence of new inflammation.—B. C.

1767. Eine typische Form der Brustentzündung im Wochenbett. (*A Typical Form of Mastitis during Parturition.*) P. Mathes. München. med. Wchnschr., 1921, **68**, 15.

A superficial inflammation of rapid onset and decline occurs frequently about 2 weeks after parturition. It does not involve the nipple, nor is it a true mastitis. It spreads in sectors from an encrusted rhagade.—B. C.

DERMATOLOGY

(*See also Number 1773*)

1768. Experiments on Alastrim. James P. Leake and John N. Force. Pub. Health Rep., Wash., 1921, **36**, 1437–1443.

Experiments on monkeys and rabbits were carried out with the purpose of determining the relationship of alastrim to smallpox. Pustule contents from several cases of alastrim in Jamaica and crusts from an alastrim patient in Haiti were tested on monkeys; vesico-papular eruptions resembling eruptions produced by the inoculation of the pustule contents of a case of smallpox were obtained. A monkey successfully inoculated with Haitian and Jamaican alastrim was refractory to a strain of vaccine virus which produced typical vaccinia in a normal monkey. Rabbits were also immunized to alastrim and later shown to be almost completely immune to vaccine virus. Smallpox crusts, vaccine virus and alastrim material produced positive intracutaneous reactions in animals immunized to vaccine virus. These results point to the essential identity of alastrim with smallpox.—I. A. B.

1769. Impetigo-Nephritis. Hans Kohn. Berl. klin. Wchnschr., 1921, **58**, 28–29.

Nephritis is a rare complication of impetigo. It is suggested that the intercurrent nephritis is really due to some other infectious agent, probably diphtheria.—B. C.

1770. Ueber die Behandlung des Lupus vulgaris mit dem Friedmannschen Mittel. (*The treatment of Lupus vulgaris with the Friedmann Vaccine.*) A. Buschke. Berl. klin. Wchnschr., 1921, **58**, 3–7; 86–87.

No definite progress has been made with the Friedmann vaccine. It may possibly be of help in mild skin tuberculosis.

Friedmann objects to the conclusions of Buschke, and the latter amplifies his views.—B. C.

OPHTHALMOLOGY

(*See Number 1781*)

OTOLOGY AND NOSE AND THROAT DISEASES

(*See also Number 1807*)

1771. Ozena and Its Relation to Tuberculosis. F. H. Linthicum. Am. J. M. Sc., Phila., 1921, **162**, 216–226.

Ozena is frequently associated with tuberculosis. Of 28 cases which came to autopsy, tuberculosis was present in 20, and was the cause of death in 15; a family history of tuberculosis was found in 73 of 129 cases; and in 126 cases a definite clinical tuberculosis was found in 52. All of this has an interesting bearing upon the etiology of ozena, and brings up the question of an etiological connection between the two diseases. As yet the etiology of ozena has not been settled. Among the various organisms which have been found commonly in the nasal crusts from patients suffering from this clinical condition, the Abel-Löwenberg bacillus and Perez's *Cocco-bacillus fetidus ozenae* have received the most attention from investigators. But, an acid-fast bacillus also is commonly found in the nasal crusts, which has received serious attention from several workers as an etiological factor. It has been found that many of these bacilli are not alcohol-fast, so the writer advises that in making the stain by the Ziehl-Neelsen method to decolorize in an acid bath using 25 per cent sulphuric acid. The preparations are first made by dissolving a bit of the crust in sterile salt solution, and spreading on a slide by means of a platinum loop. Care must be taken not to over-heat in fixing, as this distorts the organism. Counter-staining is done with methylene blue. In such stained preparations the acid-fast organisms stand forth a bright red in contrast to the blue of other organisms. The morphology of these organisms is variable; it may range all the way from streptothrix-like clumps to short, thick rods. Frequently, they occur as thin, curved, beaded rods, identical in appearance with the tubercle bacillus. The organism has been isolated and grown by Wingrave on Dorset's egg medium reinforced by ozena crusts. But the writer had not the opportunity to continue his work along these lines. Animal experiments have been reported where guinea pigs injected subcutaneously with emulsions made from the ozena crusts developed tuberculosis. The writer carried out a series of tests upon guinea pigs, using material from cases in which acid-fast bacilli were demonstrated in smear by staining. The animals were injected, some intraperitoneally, others subcutaneously, but in no instance could tuberculous lesions be found where the pig survived sufficiently long after injection to permit their development. Linthicum also treated a series of clinical cases with tuberculin, with rather favorable results on the whole.—L. W. F.

1772. Die Untersuchung der Ohrlabyrinths als Hilfsmittel bei der Diagnostik [illegible] *(Examination of the Ear Labyrinth as an Aid in the Diagnosis of Syphilis.)* [illegible] GÜTTICH. Berl. klin. Wchnschr., 1921, **58**, 277–278.

The auditory nerve is among the first of the cranial nerves attacked in many [illegible]. Functional tests of the ear, therefore, are useful in detecting the disease.—B. C.

FILTERABLE VIRUSES

(*See also Numbers 1737, 1738, 1739, 1742*)

1773. Recherches expérimentales sur l'herpés. (*Experimental Investigation of* [illegible] GEORGES BLANC, J. TSIMINAKIS AND J. CAMINOPETROS. Compt. rend. Soc. de b[illegible], 1921, **85**, 290–291.

Bile quickly destroys the virus of herpes, as it does that of rabies and of ence[illegible]. The herpetic virus, differing from that of vaccinia, is not destroyed by neutral r[illegible] serum of human cases of encephalitis does not appear to neutralize the herpetic [illegible].—G. H. S.

1774. On the Etiology of Typhus Fever. E. W. SCHULTZ. Am. J. M. Sc., Phila., 1921, **161**, 78–90.

In a critical review of the more recent work upon the etiology of typhus fever, Schultz discusses the relationship to the disease of such organisms as *B. typhi-exanthematici* (Plotz), Proteus, X19 (Weil and Felix), and the *Rickettsia prowazeki* (Ricketts and Wilder, Prowazek, and others). The important work of Da Rocha-Lima on infected lice is fully considered, also there is a discussion of Anigstein, and the author's laboratory observations, as carried out at the Central Epidemiologic Institute, at Warsaw, Poland, on the blood of typhus cases. In his conclusions the writer expresses the opinion that "the *Rickettsia prowazeki* are probably the cause of typhus fever." The present article is based upon Schultz's "Closing Report of the Bureau of Medical Research," American Red Cross Commission to Poland (dated June 30, 1919).—L. W. F.

SURGICAL BACTERIOLOGY

1775. The Bacteriology of Infectious Gaseous Gangrene. M. C. PEASE. Proc. Soc. Exper. Biol. & Med., N. Y., 1919, **17**, 30–33.

Pease states that infectious gaseous gangrene cannot be considered necessarily as a monomicrobic disease, but frequently is due to an association of bacteria of the group. Certain numbers by themselves are not pathogenic, even under most favorable circumstances, by animal inoculations. A particular group of anaerobes is responsible for this disease; all produce powerful toxins, which exert not only a local but a systemic action. Death in gaseous gangrene is due to general toxemia from absorption of the toxin, and not to the direct result of the local condition. The bacterial toxins are distributed along the line of the muscle sheaths and fascia, and through the lymph spaces; the toxins cause tissue necrosis and a spreading of the local lesion. The development of the gaseous gangrene depends directly upon the elaboration and absorption of toxins, if this does not occur. Aerobes do not enter as a cause of the disease but may complicate the condition. The author groups the anaerobes which are always found, either separately or associated in cases of gaseous gangrene, as follows:

Group I. *Essential Causal Agents of Gaseous Gangrene*

Saccharolytic:
  1. *Vibrion septique*
  2. *B. eodematicus* (*B. novyi*)
  3. *B. welchii*
Proteolytic:
  B. histolyticus

Group II. *Accessory Agents of Gaseous Gangrene*

Comprises organisms capable of causing gaseous phlegmous (even of a severe type). Probably rarely or never an essential agent of gaseous gangrene. Important in association with the essential causal agents and generally unimportant when occurring alone.

I. Anaerobes:
  A. Proteolytic group:
    B. sporogenes
    B. aerofoetidus
  B. Saccharolytic group:
    B. fallax
II. Aerobes:
  B. coli
  B. proteus
(Both very doubtful as causal agents of true gaseous gangrene.)

Group III. *Organisms Merely Present in Gaseous Gangrene*

Never essential causal agents, though they may be capable of causing complications, and may have an importance in symbiosis with other organisms, and may be a cause of a great modification of the clinical picture.

- A. Anaerobes:
  - Proteolytic:
    - *B. putrificus*
    - *B. bifermentans* (also has a powerful saccharolytic action)
    - *B. tetani*
    - *B. tertius*
- B. Aerobes:
  - Cocci:
    - Streptococcus, staphylococcus, and diplococcus
  - Bacilli (Gram-negative)
    - *B. anthracoides* group
    - *B. mesentericus* and *mycoides* group, etc.

Great variations in pathogenicity are shown in this entire series. Some strains of *B. welchii* and *B. oedematicus* have almost no virulence; especially the former species show strains varying by marked extremes in this respect.

In a series of 308 cases of gaseous gangrene, including 91 from Weinberg's series, and 217 from wounded American soldiers, reports of bacteriological analysis of the various pathogenic anaerobes are as follows:

	per cent
B. welchii	85.0
B. sporogenes	35.4
B. oedematicus	12.6
Vibrion septique	17.2
B. fallax	6.4

Owing to the difficulties in the isolation of *B. oedematicus, fallax, histolyticus*, and *aerofoetidus* in pure culture, the table does not show their true incidence. But it does show that infectious gangrene is usually a mixed infection. Only 79 of the group of 308 cases were infected with a single pathogenic anaerobe. From 2 to 6 anaerobes were present in the local lesion of 229, and nearly always at least 2 pathogenic anaerobes.—L. W. F.

1776. Infection of the Kidneys Following Prostatectomy. J. W. MARCHILDON. Am. M. J. Sc., Phila., 1921, **161**, 243–251.

In almost all cases of hypertrophy of the prostate suffering from urinary retention, the bladder becomes infected, and not infrequently the infection, after immediate prostatectomy, spreads to other parts of the body, especially ascending to the kidneys and causing a pyelonephritis. This condition may be a cause of death. Also a group of cases exists where no infection of the bladder is recognizable, following a complete prostatectomy, infection occurs with either a blood invasion of organisms, or an ascending infection to the kidneys takes place. Autopsy has shown, in the writer's experience, that pyelonephritis is the most common cause of death following prostatectomy. The colon bacillus, streptococcus, and staphylococcus are the organisms most commonly complicating the disease. The author discusses fully the surgical aspects of this group of cases, and suggests procedures to guard against these conditions, in so far as possible by prolonged, free, suprapubic drainage, and treatment for infection in preparation for the operation.—L. W. F.

1777. Ist die Hautjodierung bei Bauchschnitten erlaubt? (Is Painting of the Skin with Iodine Permissible in Laparotomies?) KARL PROPPING. München. med. Wchnschr., 1921, **68**, 11–12.

Iodizing the site of a laparotomy is almost certain to lead to undesirable adhesions. A 5 per cent tincture (in absolute alcohol) of tribromnaphthol is suggested as a substitute for tincture of iodine for this purpose. Their disinfecting powers are about alike and no adhesions are formed following use of the new antiseptic.—B. C.

1778. Beitrag zur Therapie schlecht heilender Wunden. (On the Therapy of Poorly Healing Wounds.) OSCAR DIETERICH. München. med. Wchnschr., 1921, **68**, 44–46.

Phaseolus vulgaris was stimulated in growth in a nutrient solution by the application of electrolysis. Stubborn wounds immersed in saline and subjected to electrolysis (4 to 8 volts and 10 milliamps.) improved after a while, and healing was accelerated. The result is claimed to be due to an improved nutrition of the tissue surrounding the wound.—B. C.

SEROLOGY

(*See also Number 1694*)

1779. Studies on Heterophile Antigen and Antibody. 1. The Specific Relationship of Heterophile Antibodies to Certain Tissue Lipoids. T. TANIGUCHI. J. Path. & Bacteriol., Edinb., 1921, **24**, 217–240.

A brief review is given of the literature on "heterophile" and "isophile" tissues and their respective antibodies. Heterophile substance is contained in the organs of the guinea pig, horse, dog, cat, mouse, fowl and tortoise, as well as in sheep sperm, mouse cancer, gills of carp and pike, urine and lens of horse and guinea pig, sheep and goat corpuscles and paratyphoid and Gaertner bacilli. On the other hand, the organs of man, rabbit, ox, sheep (except blood corpuscles), rat, goose, pigeon, eel, frog, tai fish, etc., lack this property. Animals belonging to the first group are designated as the "guinea pig type," while those of the second group are known as the "rabbit type." The term heterophile is defined as referring to an antibody having an affinity for the receptors of a species other than that furnishing the antigen used to produce it. The important fact is noted that the serum of animals of the "guinea pig" type is, in general, capable of generating heterophile sheep hemolysin when injected into rabbits.

The following phases of the question are touched upon;

A. Specific Fixation of Heterophile Antibody by the Lipoids of Heterophile Organs.

These experiments show that when heterophile amboceptor (known as Forssman immune body, or F-IB) for sheep corpuscles is mixed with saline emulsions of alcoholic tissue extracts derived from a heterophile antigen, the latter can inhibit the immune body to a varying degree, so that sheep corpuscles subsequently introduced into the mixture fail to become sensitised. Alcohol extracts of all the heterophile antigens examined exerted this inhibitory effect on the heterophile antibody, nor was it ever observed with non-heterophile antigens. The fixing power of a watery cell suspension of heterophile antigen for the antibody was found to parallel closely that of the alcoholic extract. The degree of inhibition was found to vary with different specimens of antiserum. Fixation occurs equally well in the icebox (5°C.) and in the incubator (37°C). It is nearly maximal when the digestion of immune body with alcoholic extract has proceeded for 30–60 minutes at 37°C. As in the Wassermann reaction, turbidity of the saline emulsion of alcoholic extract was found to enhance the fixation of immune body, while the addition of cholesterol also enhanced the antigenic power of the alcoholic extracts. It was found that emulsions of heterophile antigen have only a slight influence in inhibiting hemolysis when emulsion, immune body and sheep corpuscles are mixed and digested simultaneously, the slight inhibition being due, perhaps, to the specific reaction of alcohol-soluble constituents of heterophile antigen with the heterophile antibody—it is possible that the immune body has been fixed by the specific lipoid in the sense of fixation of antigen and antibody in other immunity reactions. The sheep hemolysin contained in the sera of guinea pigs *vs.* sheep corpuscles, and rabbits *vs.* ox corpuscles, and the ox hemolysin in the sera of rabbits *vs.* ox corpuscles and guinea pigs *vs.* sheep corpuscles, are not fixed by the alcoholic extracts of either heterophile or non-heterophile tissues, thus behaving quite differently from Forssman immune body. Moreover, it is characteristic of heterophile antibody to be fixed by cell emulsions of heterophile tissues, but not by those of non-heterophile organs. As regards anti-sheep amboceptor obtained by injecting sheep corpuscles into rabbits, fixation with lipoid emulsions derived from heterophile antigens is not always uniform; in general, antibody obtained after a single injection of sheep corpuscles is well fixed, while that obtained after several injections is fixed relatively slightly by heterophile antigens. The fact that homologous immune serum for sheep corpuscles from the rabbit contains Forssman antibody supports the theory of Forssman and Hintze and others that the cause of the primary toxicity of immune sera lies in the interaction of Forssman antibody with the corresponding antigen.

B. Complement Fixation Exhibited by Heterophile Antibody in the Presence of Alcoholic Extracts of Heterophile Antigens.

1. Heterophile immune body can fix complement in the presence of alcoholic organ extract, the amount of complement fixed by a serum containing heterophile antibody being much greater with extracts of the organs which act as heterophile antigens than with others.

2. Serum containing heterophile antibody, which has been digested with the cells of tissues capable of acting as heterophile antigens, and which has thereby lost its hemolytic immune body, has also lost most of its power to fix complement with extracts of heterophile organs, the complement-fixing power remaining being practically the same with extracts of heterophile and non-heterophile organs. Digestion with suspensions of non-heterophile tissues gives no similar reduction in the complement-fixing power.

It is noted that a positive Wassermann reaction has frequently been observed in normal rabbit serum, but the author states that in this case no marked difference was observed with extracts from heterophile and non-heterophile tissues. It is assumed that complement fixed by the heterophile antiserum from the rabbit along with the lipoid emulsions of heterophile antigens will be the sum of the amounts fixed (a) through the interaction of specific lipoid and heterophile antibody, and (b) through the combination of non-specific lipoid and the Wassermann reactive body contained in the rabbit serum. The assumption is supported by the following points;

1. Rabbit sera containing heterophile antibody, which have been treated with heterophile organ cell suspensions and so deprived of practically all heterophile hemolytic immune body fix practically equal amounts of complement in the presence of lipoid emulsions of both heterophile and non-heterophile tissues.

2. The hemolytic immune sera known to contain heterophile immune body all show this reaction (sera from rabbit *vs.* guinea pig kidney or liver and serum from rabbit *vs.* sheep corpuscles), while hemolytic immune sera of non-heterophylic nature do not (sera from rabbit *vs.* ox corpuscles and guinea pig *vs.* sheep corpuscles).

3. Normal rabbit serum contains a varying amount of heterophile antibody for sheep corpuscles, but except in the few cases where it is relatively great in quantity, this serum fixes practically the same amount of complement with lipoid emulsions of heterophile and non-heterophile antigens.

Since serum containing heterophile antibody, when digested with watery cell suspensions of heterophile tissues, is deprived of both its hemolytic immune body and its power of fixing complement specifically with extracts, it is thought that the hemolytic immune body and the complement fixing body are identical. Complement was fixed both in the ice box and at 37°C. Turbid lipoid emulsion fixed more complement than clearer emulsion prepared by rapid mixture of alcohol extract with saline, while the addition of cholesterol to the alcoholic extract of heterophile tissue also enhanced the property of fixing complement with heterophile antibody. The fact that heterophile antiserum fixes complement with alcoholic extracts of the corresponding antigens supports the assumption that the receptors of heterophile tissues are lipoid in nature, and may throw light on the nature of the primary toxicity of antisera as due to anaphylaxis to lipoids, and on the nature of the serum constituent giving rise to a positive Wassermann reaction.

C. Precipitation of Emulsions of Lipoids Derived from Heterophile Tissues by the Heterophile Antibody.

1. In all cases examined precipitation occurred when heterophile antibody and saline emulsions of heterophile lipoids were mixed. (As heterophile antibody, the following sera were used; rabbit *vs.* guinea pig kidney and liver, and rabbit *vs.* sheep blood. As antigens, alcoholic extracts of guinea pig heart and kidney, horse and cat heart and sheep blood corpuscles.)

2. This reaction never occurred with (a) heterophile antiserum and lipoid emulsions of non-heterophile tissues or (b) non-heterophile serum and lipoid emulsions of heterophile tissues. (As non-heterophile antiserum, rabbit *vs.* ox corpuscles and guinea pig *vs.* sheep corpuscles. As non-heterophile antigen, alcoholic extracts of human, ox, rabbit and pig heart.)

3. Heterophile antiserum was deprived of its precipitating power by digestion with watery suspensions of heterophile tissues, but not with cell suspensions of non-heterophile tissues.

4. Normal rabbit serum never caused precipitation of heterophile lipoid emulsions unless it contained a large amount of immune body for sheep corpuscles. The sera of rabbits giving a positive Wassermann caused precipitation with lipoid emulsions of non-heterophile tissues, too, though to a slighter degree than with lipoids of heterophile tissues. After treatment of these sera with watery suspensions of heterophile tissues, to remove most of the heterophile hemolytic immune body, they precipitated lipoid emulsions of both heterophile and non-heterophile tissues to practically the same degree, in virtue of what may be termed their content in "Wassermann body." Hence, in estimating the specific reaction between heterophile immune sera from the rabbit with lipoids of heterophile antigens, it was always necessary to determine at the same time the degree of precipitation with non-heterophile lipoids and to make allowances for them.

5. The reaction occurred in the ice box (5°C.), or at room temperature, but precipitation was heavier after incubation at 37°C.; at the lower temperatures, non-specific precipitation occurred, as it did also in the emulsion and serum controls without addition of lipoid. In media containing little salt, non-specific precipitates were formed similar to those at the first stage of Meinicke's test (1917, 1918) for the detection of syphilis in human serum. The addition of cholesterol to the specific lipoid intensified precipitation, as did also turbid emulsions produced by slow admixture of lipoid with saline. It was found that the precipitate formed when heterophile lipoids were allowed to react completely with the corresponding antisera contained practically the total amount of specific lipoid, alcoholic extracts of such precipitates being practically as efficacious as the original extract for producing hemolysis with cobra venom and for fixing complement with heterophile antibody, while the supernatant fluid possessed these properties only to a minimal degree. In this case also the precipitating power of heterophile antiserum for heterophile lipoid is quantitatively parallel to its hemolytic power for sheep's blood and its complement fixing power with heterophile lipoids, indicating that all three reactions are probably due to the same constituent of the antiserum.—I. W. P.

1780. Ueber neue Körper mit bisher unbekannter Wirkung im menschlichen Serum. (*Substances of hitherto Unknown Effect in Human Serum.*) M. Mandelbaum. München. med. Wchnschr., 1920, 67, 1229–1232.

The new bodies, designated "cytophilins," occur in human blood combined with "endglobulin" and are set free by incubation of the globulin solution at 37°C. They have a marked affinity for red cells, regardless of the source, whether of homologous or heterologous individuals, families or species. Cells charged with cytophilins destroy the complementary effect of added fresh guinea pig serum; and they are discharged by active or inactive human serum. Cytophilins are perhaps a preliminary stage of the amboceptors. They are colloids and their activity is damaged by heating to 56°C.—B. C.

1781. The Specific Precipitation Reaction of the Lens. Ludvig Hektoen. J. Am. M. Ass., Chicago, 1921, 77, 32.

"The precipitin reactions of the lens of certain mammals (and of the chicken) are lens-specific and the lens, at least of the mammals in question, does not appear to contain any species-specific precipitinogens; hence the lens protein may be regarded as chemically distinct and as identical in diverse species. Perhaps further studies by means of lens-specific reactions may prove of interest."—P. G. H.

1782. The Diagnosis of Syphilis in Malarial Subjects by the Wassermann Reaction. J. Pratt Johnson. J. Path. & Bacteriol., Edinb., 1921, **24**, 145–149.

In all cases the diagnosis of malaria was confirmed microscopically, the clinical material being drawn from cases under treatment in R. A. M. C. hospitals during the war. The serum from each patient was divided into 4 parts and tested by 2 or more of the following methods;

(1) Original Wassermann method (modified by using two M. H. D. of complement).
(2) Tschernogobouw's modification.
(3) Fleming's modification.
(4) Hecht-Fleming method.

The tests were carried out in 4 different laboratories, each employing one of the above methods. To facilitate comparison of the results, Wassermann tests were recorded in terms of percentage hemolysis, readings of 50 per cent hemolysis or less being recorded as positive.

Seventy-four cases were included in the study, being grouped as follows, with reference to the time of bleeding;

Group A, 19 cases.—First blood specimen collected during an actual rigor, or on the same day at a short interval after rigor.

Group B, 45 cases.—No record of rigor available, but first specimen collected when parasites were present in the peripheral blood.

Group C, 10 cases.—Blood collected during period when no parasites were found, but typical relapses subsequently developed with parasites in the finger blood.

Cases clinically syphilis, or giving a previous history of syphilis, were excluded from the series, though it was not always easy to avoid the latter since previous infection was always denied, owing to the regulations in military hospitals, penalizing sufferers from venereal disease.

Complete agreement with the 4 different methods was obtained in only 57 per cent of the cases, due largely to the sensitiveness of the third and fourth methods, which sometimes gave indefinite reactions in cases where the other two were definite. However, if only those sera were counted as positive that proved to be positive on subsequent retesting, uniformity in result was obtained in 92 per cent of cases. These figures show the importance of retesting when the only evidence of syphilis is one positive Wassermann.

These investigations indicate that the blood in active benign tertian, malignant subtertian and mixed (B. T. plus M. T.) malaria does not give a positive Wassermann. Positive reactions in these cases are thought to be due to latent syphilis, or to errors in technique, or to non-specific and obscure changes in the patient's serum. In such cases the serum should be retested after an interval, a subsequent positive test indicating the presence of syphilis.—I. W. P.

1783. L'agglutination plasmatique, facteur d'instabilité des particules introduites dans la circulation. (Plasmatic Agglutination, a Factor Influencing the Stability of Particles Introduced into the Circulation.) Paul Govaerts. Compt. rend. Soc. de biol., Par., 1921, **85**, 244–245.

In addition to the recognized humoral and cellular factors which play a part in the elimination of bacteria or other particulate matter from the circulation that of plasmatic agglutination should be considered. This type of reaction is associated with certain physical changes which under definite circumstances take place between the surface of the introduced particles and the plasma. Such reactions apparently do not occur with serum, and with any given type of particle the same reaction is not to be expected in sera of different species. Thus, certain China inks are perfectly stable in rabbit serum, but in rabbit plasma the particles are immediately agglutinated.—G. H. S.

1784. Sur l'agglutination des microbes atténués. (Agglutination of Attenuated Bacteria.) Paul Fabry. Compt. rend. Soc. de biol., Par., 1921, **85**, 237–238.

Experiments previously reported for *B. typhosus* were repeated with *B. shigae* as agglutinogen. The results indicate that the organisms acquire an increased agglutinability when cultivated in bouillon containing phenol. Normal organisms agglutinated in serum dilutions of 1 : 320; organisms from the phenol medium agglutinated in the same serum in dilutions of 1 : 1280. A similar increase in agglutinability by acid also occurs.—G. H. S.

1785. La fonction antixénique des globulines, (The Antixenic Function of Globulins.) Jacques Roskam. Compt. rend. Soc. de biol., Par., 1921, **85**, 269–271.

The ability of the serum globulins to mass around bacteria and agglutinate them is a purely passive phenomenon, associated with the colloidal equilibrium of the plasma.—G. H. S.

1786. Zur Konservierung des Komplements. (The Preservation of Complement.) Johann Hammerschmidt. München. med. Wchnschr., 1921, **67**, 1382.

Rhamy's observation is confirmed that a 10 per cent solution of sodium acetate in physiological saline when mixed with fresh guinea pig serum in the proportion of 6 to 4 preserves the complement perfectly for at least 10 days.—B. C.

1787. Ueber die Möglichkeit, die Komplementwirkung durch Säure oder Alkali wiederherzustellen. (*On the Possibility of Restoring the Activity of Complement by the Addition of Acid or Alkali.*) H. Schmidt. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, Teil I, Orig., 1921, **31**, 125–136.

The "end-piece" of the complement of guinea pig serum, obtained by fractionation with CO_2, cannot be reactivated by neutralization with alkali in an isotonic solution. In hypotonic fluid, a certain amount of hemolysis of sensitized red cells is obtainable, but this result is not due to a reactivated complement, but to the lowered osmotic pressure.

With the "end-piece.' of complement obtained by the action of dilute HCl some hemolysis is produced when no alkali is added. This result, however, is not a consequence of the action of the fraction of complement, but is due to the action of the acid upon the cells.

Complement which has been inactivated by heat and by shaking cannot be reactivated by the addition of acid or alkali.

The results obtained by Bronfenbrenner and Noguchi, which differ from these reported in this paper, are attributable to their failure to preserve the isotonicity of the fluids which they used.—S. B-J.

1788. Ueber das Verhalten der roten Blutkörperchen gegenüber Schwermetallsalzen. (*On the Effect of the Salts of the Heavy Metals upon Erythrocytes.*) W. Schürman and Th. Baumgärtel. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, Teil I, Orig., 1921, **31**, 151–160.

The salts of copper, nickel and iron possess a marked ability to agglutinate red corpuscles, while the salts of lead and mercury are almost unable to produce this effect. The chloride, nitrate, sulfate and acetate of copper precipitate normal cells as well as red cells sensitized with amboceptor. Copper ammonium chloride precipitates only washed normal red cells.

The chloride, nitrate and acetate of nickel precipitate only sensitized sheep cells.

Ferric chloride precipitates normal red cells of the sheep and ox. This salt agglutinates sensitized ox corpuscles more strongly than normal cells.

Sheep and ox corpuscles were used in these experiments. The concentrations of the salts used varied from N/15 to N/51,200. The discussion points out the bearing of these findings upon the physical-chemical theories of agglutination.—S. B-J.

1789. La réaction de Hecht dans la grossesse. (*The Hecht Reaction in Pregnancy.*) M. Watrin. Compt. rend. Soc. de biol., Par., 1921, **85**, 264–265.

The Hecht reaction is advocated in testing the serum during pregnancy because of the increase at that time of antisheep hemolysin. Fetal blood does not contain antisheep amboceptor but does contain complement, the antitryptic power and the ability to activate venom hemolysis is more marked in maternal than in fetal blood. Maternal blood shows a hypercholesterolemia, fetal blood a deficiency in cholesterol.—G. H. S.

1790. La réaction de Bordet-Gengou dans le diagnostic de la dourine. (*Bordet-Gengou Reaction in the Diagnosis of Dourine.*) A. Bessemans. Compt. rend. Soc. de biol., Par., 1921, **85**, 256–258.

The sera of 81 animals suspected of infection, or actually infected, with dourine were tested in the complement fixation reaction with antigens prepared from Trypanosomes of surra, nagana, and dourine. The sera were inactivated and complemented with guinea pig serum. Of the animals tested the 7 which were clinically infected gave fixation with all 3 antigens; 20 normal animals gave negative reactions. Seventeen other horses showed clinical evidence of infection and were treated with atoxyl and 3 of these gave negative reactions after prolonged treatment. Of the 37 suspected animals 19 gave negative, 11 weakly positive, and 7 strongly positive reactions. No essential quantitative or qualitative difference could be detected between the fixations with the different Trypanosome antigens; emulsions of spirochetes and organ extracts were inert.—G. H. S.

1791. Der gegenwärtige Stand unserer Kenntnisse der Fettantikörper. (*The Present State of Our Knowledge of Fat Antiboides.*) Hans Schmidt. München. med. Wchnschr., 1921, **68**, 69–71.

A general review is given of the specific and non-specific responses of the body to proteins, carbohydrates and fats. Bacterial fats are distinguishable from neutral animal fats in possessing components of complex structure which are antigenic in nature. It is interesting to note that chaulmoogra oil is related to the fats of the acid-fast bacilli in this respect.—B. C.

1792. Die Rolle der Albumine und Globuline bei der Wassermannschen Reaktion. (*The Rôle of Albumins and Globulins in the Wassermann Reaction.*) H. Felke. München. med. Wchnschr., 1920, **67**, 1291–1292.

The author discusses European contributions to the subject. He found that removal of globulins from positive sera left the latter fully reactive toward specific leutic tests.—B. C.

1793. Méthode thermique pour l'élimination du pouvoir anti-complémentaire des sérums dans la réaction de Wassermann. (*Removal of the Anticomplementary Property of Serum by Heat.*) S. Mazza. Compt. rend. Soc. de biol., Par., 1921, **85**, 311–312.

Sera, which after the usual fixation at 37°C. show themselves to be anticomplementary, may yield a clear-cut fixation by a further incubation at 50°C.—G. H. S.

1794. Vergleichende Untersuchungen über die Luesdiagnose mit Hilfe der Wassermannschen reaktion, der Sternschen Modifikation und der Ausflockungsreaktion nach Sachs-Georgi. (Comparative Studies in Syphilis Diagnosis by the Aid of the Wassermann Reaction, the Stern Modification, and the Flocculation Reaction of Sachs-Georgi.) **Gerhard Müller.** Berl. klin. Wchnschr., 1921, 58, 253–256.

As a result of comparisons in over 2400 cases it is concluded that the Wassermann reaction remains still the most delicate and reliable test for all stages of syphilis. While the flocculation tests are simpler in technic and thus more attractive, it has not yet been proven that they can be relied upon fully. It is agreed that the latter constitute valuable adjuncts to the Wassermann test.—B. C.

1795. Ueber das Wesen der Gerinnung und der Luesreaktionen. Wassermann, Sachs-Georgi, Hirschfeld-Klinger. (The Nature of Clotting and the Syphilis Reactions; Wassermann, Sachs-Georgi, Hirschfeld-Klinger.) **Ernst Fränkel.** Berl. klin. Wchnschr., 1921, 58, 198–199.

All three tests are dependent fundamentally upon the reaction of syphilitic serum with the same extract components which include cholesterol, jecorin, soaps and lecithin (phosphatides). The different reactions are merely indicators of the same precipitation process which appears to be mainly of a physical nature.—B. C.

1796. Beeinflussung der Wassermannschen Reaktion des normalen Kaninchens durch Quecksilber und Salvarsan. (Influencing the Wassermann Reaction of the Normal Rabbit with Mercury and Salvarsan.) **Gustav Emanuel.** Berl. klin. Wchnschr., 1921, 58, 197–198.

The author recalls his work of 1911 in which he found temporary disappearance of the Wassermann reaction in normal rabbits 5 to 7 days after intravenous injection with salvarsan. The temporary negativity of a positive Wassermann reaction in man, however, may not be regarded without further proof as indicative of the therapeutic effect of salvarsan administration.—B. C.

1797. Ueber die Wassermannsche Reaktion bei Kaninchen. (The Wassermann Reaction in Rabbits.) **Max H. Kuczynski.** Berl. klin. Wchnschr., 1921, 58, 125–126.

A negative Wassermann reaction was obtained with the inactivated sera of normal healthy rabbits, but a coccidiosis produces a positive serum within 4 to 8 days. A coccidiosis in rabbits was never missed when the Wassermann reaction was positive.—B. C.

1798. Neue experimentelle Forschungen über Syphilis. (New Experimental Investigations in Syphilis.) **August von Wassermann.** Berl. klin. Wchnschr., 1921, 58, 193–197.

A substance is present in syphilitic serum which is named the Wassermann substance. This has the property of binding lipoids to form aggregates. The latter are always readily separable into these two specific components. The Wassermann substance belongs to the class of antibodies, and is the first antibody isolated from man and animal produced by a lipoid antigen.

For doubtful Wassermann reactions, the author has devised a confirmatory test (details of which are absent) which makes use of the separability of antigen-antibody components from the Wassermann aggregate. It has been found that the flocculation reaction of Sachs-Georgi is fundamentally dependent upon the formation of the Wassermann aggregate. The Wassermann reaction depends upon the action of a genuine amboceptor (in Ehrlich's sense) for lipoids; and the syphilitic tissue cell has a specific pathologic lipoid metabolism which produces the active material.

It is claimed that mercury may exert a specific effect upon syphilitic tissue without influencing the spirochetes except perhaps secondarily.—B. C.

1799. Réaction du benjoin colloidal et réaction de Bordet-Wassermann dans la syphilis nerveuse. (The Colloidal Benzoin and Bordet-Wassermann Reactions in Syphilis of the Nervous System.) **René Benard.** Compt. rend. Soc. de biol., Par., 1921, 85, 219–221.

In certain cases which appear to be syphilis of the nervous system clinically but in which no serological evidence can be obtained the colloidal benzoin appears to be of great value. A case report is given substantiating this opinion. With the reaction a diagnosis was established and the effect of treatment was followed.—G. H. S.

1800. Ueber den serologischen Luesnachweis mittels der Ausflockungsreaktionen nach Meinicke und Sachs-Georgi. (The Serologic Test for Syphilis by Means of the Flocculation Reactions of Meinicke and Sachs-Georgi.) **Karl Pesch.** München. med. Wchnschr., 1920, 67, 1232–1233.

The flocculation reactions are valuable, but because they sometimes respond non-specifically, it is not yet safe to supplant the more tedious Wassermann reaction with them.—B. C.

1801. Beitrag zur Sachs-Georgi Reaktion. (Observation on the Sachs-Georgi Reaction.) **Rudolf Somogyi.** München. med. Wchnschr., 1920, 67, 1233.

The surface tension of the Sachs-Georgi system changes during the course of the reaction. The surface tension varies in the same direction for positive and negative sera, but very greatly for negative sera. In the conduct of the test, the results could be designated numerically by means of the surface tension determinations.—B. C.

1802. Die klinische Verwendbarkeit der Sachs-Georgischen Reaktion, speziell der Mikromethode, auf Lues. (*The Clinical Utility in Syphilis of the Sachs-Georgi Reaction, especially the Micro-Method.*) KURT SCHEER. München. med. Wchnschr., 1920, **67**, 1352–1353.

Comparative examinations of clinical cases were made by the Sachs-Georgi reaction, the author's micro-method, and by the Wassermann reaction. There was a 93.75 per cent agreement in 336 examinations, and the micro-method yielded somewhat sharper results than did the Sachs-Georgi. In congenitally syphilitic infants born with symptoms absent, the serologic tests were positive several days before definite clinical signs became apparent.—B. C.

1803. Zur Therorie der Sachs-Georgischen Reaktion. (*The Theory of the Sachs-Georgi Reaction.*) KURT SCHEER. München. med. Wchnschr., 1921, **68**, 43–44.

Flocculation was performed on a large scale and the sediment centrifugated, dried, weighed and extracted with ether. By this procedure, it was shown that the Sachs-Georgi reaction is concerned with a combination of the serum globulins with lipoids of the tissue extract.—B. C.

1804. Die Luesreaktionenvon Meinicke und Sachs-Georgi in der inneren Medizin. (*The Syphilis Reactions of Meinicke and Sachs-Georgi in Internal Medicine.*) KARL HAJÓS AND BÉLA MOLNÁR, JR. Wien. klin. Wchnschr., 1920, **33**, 966–969.

These reactions are simpler than the Wassermann reaction, but their sensitiveness is somewhat lower. The Meinicke reaction is less specific than the Wassermann, but the Sachs-Georgi has a specificity approaching the latter. The Sachs-Georgi reaction is applicable to the examination of spinal fluids, while the Meinicke is not. Neither of these may yet replace the Wassermann reaction, but the Sachs-Georgi is very helpful when the Wassermann fails.—B. C.

SERUM THERAPY

(*See also Numbers 1621, 1647*)

1805. Préparation rapide des sérums anti-diphtéritiques de haute valeur. (*Rapid Method for the Production of High Value Anti-diphtheritic Sera.*) A. SORDELLI. Compt. rend. Soc. de biol., Par., 1921, **85**, 314–315.

Old horses and a potent toxin are used. The dosage is rapidly increased and the entire course of treatment extends over a period of 23 to 32 days. Of 34 horses so treated 27 yielded sera of over 500 units. The highest values were 3200 and 2200 units, with an average value for the horses of 730 units.—G. H. S.

1806. Effects of Filtration on the Potencies of Antitoxins. W. N. BERG. J. Infect. Dis., Chicago, 1921, **29**, 86–90.

The author found that roughly the loss of antitoxic values of a filtered serum varied directly with the protein adsorbed during the filtration process.—L. C. H.

1807. Gangrène du pharynx; foyers gangréneux secondaires, disseminés sur le corps; guérison par les serums anti-gangreneux. (*Gangrene of the Pharynx; Secondary Gangrenous Foci Disseminated on the Body; Recovery by the Use of Anti-gangrene Serum.*) E. DE MASSARY. Bull. Acad. de méd., Par., 1921, **85**, 230.

The patient was admitted to the hospital complaining of pain in the lower extremities. The joints of the lower limbs were red, swollen, and painful. Routine examination of the pharynx revealed an irregular grayish white ulceration of the right tonsil. Smears from this ulcer showed a few fusiform bacilli and spirochetes. This ulceration extended progressively despite local treatment with methylene blue and injections of arseno-benzol. Daily injections were then given of from 10 to 20 cc. of each of the following serums: anti-perfringens, anti-edematiens, and anti-vibrion septique. A total of 1200 cc. of serum was given in a month.

During the course of the treatment there developed an ulceration of the penis, which eroded completely the glands, and an enormous gangrenous ulcer of the sacrum. These foci, together with the pharyngeal ulceration cleared up under further serum treatment.

The author believes that the secondary lesions were not metastatic, but were due to the infection being carried to these places by the hands of the patient. He attributes the recovery to the use of the very large doses of anti-gangrene serum.—J. E. W.

HYPERSENSITIVENESS—ANAPHYLAXIS, ALLERGY

(*See also Number 1817*)

1808. Sur les modifications de la composition du sang au cours du choc anaphylactique. I. La sécrétion d'antithrombine est rapid et courte. (*Modifications in Blood Composition in Anaphylactic Shock. I. Immediate and Transitory Secretion of Antithrombin.*) HENRI DE WAELE. Compt. rend. Soc. de biol., Par., 1921, **85**, 234.

Titrations of the antithrombin content of the blood during shock show that there is an immediate, but very transitory secretion of antithrombin.—G. H. S.

1809. Sur les modifications de la composition du sang au cours du choc anaphylactique. II. Variations du taux de la fibrine, des globulines, de l'albumine. (*Modifications in Blood Composition in Anaphylactic Shock. II. Variations in the Proportions of Fibrin, Globulins and Albumin.*) Henri de Waele. Compt. rend. Soc. de biol., Par., 1921, **85**, 234–235.

In anaphylactic shock an increase occurs in the amount of fibrin of the blood, and also the amount of globulins is augmented; while the proportion of albumin is decreased. Following shock the values for fibrin and globulin increase; that for albumin diminishes.—G. H. S.

1810. Action du sérum antiplaquettique sur les effets toxiques du sérum traité par l'agar. (*Action of Antiplatelet Serum upon the Toxicity of Serum Adsorbed by Agar.*) Edgard Zunz and Paul Govaerts. Compt. rend. Soc. de biol., Par., 1921, **85**, 248–251.

The preliminary injection of antiplatelet serum slightly diminishes the effects of a toxic injection of serum adsorbed by agar, although all of the manifestations of toxicity are secured. The antiplatelet serum injections are attended by a diminution in the number of platelets, consequently it would appear that the platelets play no essential rôle in the results of the injection of anaphylatoxin.—G. H. S.

1811. Another Case of Anaphylaxis. "A. N. C." *Guy's Hosp. Gaz., Lond.*, 1919, **33**, 406–407.

The writer reports a case of anaphylactic shock following an injection of 750 units of A. T. S. under the skin. The patient was an officer who had received a small wound on the thigh a day or two earlier while on the line. About 20 minutes after the injection he was suddenly taken ill,—scarcely able to breathe, imperceptible pulse, very rapid and feeble heart beats, asthmatic type of breathing with loud whistlings and pipings all over the chest. Under treatment the symptoms became lessened, but an urticarial rash over the trunk and limbs appeared in about half an hour. The symptoms disappeared after 48 hours, the urticaria being the last. He had never received antitoxin previously. but on inquiry it was found that he was a "horse-asthmatic." Whenever in contact with a horse an asthmatic attack always occurred, and for this reason he had to give up a commission in the Royal Horse Artillery.—L. W. F.

1812. Ueber die Folgen der Einspritzung von artfremdem Serum, von Giften und von Antiseris in die Karotis zentralwärts. (*The Effects of Intracarotid Injections Centrally of Heterogeneous Serum, of Poisons and of Antisera.*) E. Friedberger and K. Oschikawa. Berl. klin. Wchnschr., 1921, **58**, 221–224.

Anti-sheep rabbit sera injected centrally into the carotid of the guinea pig results in acute cerebellar symptoms. The fatal dose is about one-tenth as great as when injected intravenously. The cerebellar poison is destroyed at 80°C. and is precipitable with CO_2 in the albumin fraction. The poisoning is not of the nature of anaphylactic shock.—B. C.

1813. Anaphylaxis from Diet. G. H. Pennell. Guy's Hosp. Gaz., Lond., 1920, **34**, 376.

A report is made of a patient sensitive to honey. The attack recorded followed the eating of food in which honey was used to sweeten the food instead of sugar.—C. P. B.

VACCINE PROPHYLAXIS AND THERAPY

(*See also Numbers 1647, 1759, 1770*)

1814. Sur la rapidité d'immunisation chez la Chenille de Galleria. (*The Rapidity of Immunisation in the Caterpillar; Galleria.*) S. Metalnikow and H. Gaschen. Compt. rend. Soc. de biol., Par., 1921, **85**, 224–226.

Immunisation experiments with *V. cholerae* are reported. Small doses of vaccine lead to an immunity more quickly than large doses Within 3 hrs. of the injection of a suitable dose of vaccine the caterpillars possess sufficient immunity to withstand a fatal dose. The immunity thus acquired persists for a long time and is possessed by the butterfly.—G. H. S.

1815. Zur Behandlung der Lungentuberkulose mit Partialantigenen nach Deycke-Much. (*Treatment of Pulmonary Tuberculosis with the Deycke-Much Partial Antigens.*) Felix Klopstock. Berl. klin. Wchnschr., 1920, **57**, 1115–1120.

Treatment of tuberculosis of stages I and II with partigens results generally in modifying the severity of the disease and rendering it somewhat more benign; but no definite cure has been observed.—B. C.

1816. Meine Kaltblütertuberkelbazillen und das Friedmannsche Mittel. (*My Poikilothermic Tubercle Bacilli and the Friedmann Vaccine.*) A. Moeller. Berl. klin. Wchnschr., 1921, **58**, 79–83.

Friedmann's procedure in treating tuberculosis is the same as that suggested previously by Moeller for the immunization and treatment of tuberculosis with acid-fast bacteria. The "turtle bacilli" are no other than harmless saprophytes (grass bacilli), and are therefore unable to produce immunity or cure in tuberculosis. The poikilothermic tubercle bacilli which were isolated by Moeller from the lizard, *Anguis fragilis*, are claimed to be more closely related to the human tubercle bacillus than are Friedmann's turtle bacilli."—B. C.

NONSPECIFIC THERAPY

(*See also Number 1721*)

1817. Influence curatrice du choc anaphylactique, dans certaines infections expérimental. (*Curative Influence of Anaphylactic Shock in Certain Experimental Infections.*) F. ARLOING, A. DUFOURT AND L. LANGERON. Bull. Acad. de méd., Par., 1921, **85**, 241.

One of the authors had recently observed an apparently beneficial effect resulting from anaphylaxis unintentionally provoked in the treatment of epidemic meningitis. This observation induced the authors to make an experimental investigation of the subject.

Guinea pigs were sensitised by the subcutaneous or intraperitoneal injection of from 0.1 to 2 cc. of horse serum 16 to 19 days before the experiments. These sensitized pigs and controls were injected intraperitoneally with broth cultures of the *Bacillus pyocyaneus*. The sensitized pigs were given injections of horse serum 6 hours after the injection of the cultures. The mortality among the controls was 76 per cent. Among the sensitized pigs the mortality was 20 per cent.—J. E. W.

1818. Ueber die therapeutische Wirkung der Proteinkörper, insbesondere die Behandlung der Gelenkerkrankungen mit Kaseosan, Sanarthrit, Nukleinsäure u. a. Substanzen. (*The Therapeutic Effect of Proteins, Especially the Treatment of Arthropathies with Kaseosan, Sanarthrit, Nucleic Acid and other Substances.*) FRITZ MUNK. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 119–122.

Clinical experiences are cited in the treatment of various arthropathies by the parenteral administration of non-specific proteins.—B. C.

1819. Beitrag zur Behandlung der Blennorhöe der Erwachsenen. (*The Treatment of Adult Gonorrhea.*) H. HEINEMANN AND K. WILKE. München. med. Wchnschr., 1921, **68**, 143.

Sumatran natives with gonorrheal ophthalmitis apply their own urine in treatment so that the infection is well advanced when they request medical attention. Local treatment with collargol results in cure of this condition after about 6 weeks. Injections of milk or of Lindner's caseosan produced striking improvement and cut the period of treatment to half.—B. C.

1820. Experimentelles zur Frage der Heilwirkung des normalen Pferdeserums bei der Diphtherie. (*Investigations on the Curative Action of Normal Horse Serum in Diphtheria.*) R. KRAUS AND A. SORDELLI. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, Teil I, Orig., 1921, **31**, 107–124.

Numerous experiments with young rabbits, weighing 600 to 800 grams, were conducted to test the protective and curative action of normal horse serum in diphtheria. Normal serum is capable of protecting and curing these animals after injections of doses of virulent *B. diphtheriae* and of diphtheria toxin. This protective action of horse serum is entirely related to the content of antitoxin in the serum, and is not dependent upon an "ergotropic" or other non-specific action of the serum. As horse serum usually contains about 1 unit of antitoxin per 1 cc., and as the effective dose of antitoxin for man is 1000 units or more, the authors conclude that it is irrational to recommend the use of normal horse serum in the treatment of diphtheria.—S. B-J.

1821. Ueber die experimentelle Prüfung der Wirksamkeit des normalen Rinderserums gegenüber der Milzbrandinfektion. Zugleich ein Beitrag zur Wertbestimmung des Milzbrandserums. (*Experimental Evidence of the Efficacy of Normal Beef Serum in the Treatment of Anthrax. together with a Note on the Methods of Testing Anti-anthrax Serum.*) R. KRAUS AND BELTRAMI. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, Teil I, Orig., 1921, **31**, 93–107.

Small rabbits, weighing 600–800 grams were used in these experiments, as they were found to be less susceptible than guinea pigs to anthrax infection. The rabbits were injected subcutaneously with 1/1000 of a loop of a culture of virulent *B. anthracis*, and then treated with subcutaneous injections of normal beef serum. In many of the experiments, 1 cc. of normal beef serum protected against this dose of the anthrax bacillus which killed the untreated rabbits used as controls. Parallel series of rabbits treated with the serum of steers which had been immunized to anthrax showed about the same results. The normal beef serum was as efficacious as the serum of immunized steers. Experiments with the serum of normal and immunized horses gave similar results. The complement-fixation test with anthrax serum does not provide any indication of the protective value of the serum. Normal beef serum is recommended for the treatment of anthrax infection.—S. B-J.

EXPERIMENTAL INFECTION

(*See also Numbers 1703, 1712, 1713*)

1822. Experimental Measles. F. G. BLAKE AND J. D. TRASK. J. Am. M. Ass., Chicago, 1921, **77**, 192.

Monkeys were found to be susceptible to measles, and the disease was transmitted through these animals. Blood was the material used for the passage. The virus lost in virulence and after 10 to 12 passages, the virus failed to communicate the infection. This attenuated virus, when injected intracutaneously produces a local reaction in susceptible animals, but no general infection. A similar reaction was produced by attenuating a potent virus by preservation in glycerol in an ice box.—P. G. H.

1823. The Production of Coliform Infection in the Urinary Tract of Rabbits. ELIZABETH H. LEPPER. J. Path. & Bacteriol., Edinb., 1921, **24**, 192–204.

The literature on the subject of the experimental production of lesions of the urinary tract is reviewed. The results obtained indicate that lesions are easily produced when the intravenous injection of organisms is combined with urinary obstruction, cystitis resulting from stricture of the urethra, pyelitis from stricture of the ureter. In a small per cent of cases pyelitis and pyelonephritis have been produced by the injection of organisms without subsequent stricture, there being some evidence that some strains of *B. coli* have a selective action on the kidney. The production of kidney lesions secondary to a bladder infection has not been fully determined, since in the cases recorded as positive no record has been made of blood cultures.

These experiments were undertaken in an effort to produce kidney lesions by intravenous injection of coliform organisms, in order to determine, if possible, the path of the bacilli through the kidney, and to devise a method whereby kidney infection could be brought about with reasonable certainty.

Representatives of the 3 following groups were used;

1. *B. acidi lactici.* Did not ferment dulcite or saccharose. Feebly motile. Produced acid and gas on glycerine and salicin.

2. *B. coli communis.* Fermented dulcite but not saccharose. Motile. Produced acid and gas on glycerine and salicin.

3. *B. coli communior.* Fermented dulcite, saccharose and glycerine, but not salicin. Actively motile.

All fermented lactose, and gave the methyl red reaction of Clark and Lubs, produced indol and failed to give the Voges-Proskauer reaction or to liquefy gelatin. In addition to the above fermentative reactions, agglutination with homologous rabbit serum was used to identify positively all strains recovered from animals at autopsy.

Methods used in the injection of rabbits;

1. Intravenous injection a) Series 1. 23,000,000. b) Series 2. 200,000,000. c) Series 3. 1,000,000,000. Temperature rise, 104–106°F. Two kidney lesions developed, though urine cultures were negative. Results negative except for one positive culture on the fourth day. In one rabbit with a severe septicemia all urine cultures were negative. d) Series 4. 4,000,000,000. Two of these rabbits died. The other two gave positive blood cultures at 24 and 48 hours, but never a positive urine culture.

These experiments show that in rabbits bacilli are not, as a rule, excreted by the kidneys in the course of a coliform blood infection. One strain of *B. coli*, Group 3, was encountered which showed some evidence of a selective action on the kidney, since it so regularly produced infection there; this point, however, was not clearly determined.

The localisation of the kidney infection in these rabbits was interesting. The inflammatory changes were found to be almost entirely confined to the papilla, the tip being necrosed in the most marked cases, with swelling and bacterial invasion of the cells of the tubules. In a rabbit which died in 24 hours some of the capillaries of the papilla were filled with bacteria and surrounded by polymorphonuclear leucocytes. Bacillary embolism of the capillaries seemed to be the primary effect of the intravenous injection of coliform bacilli, the other conditions following it.

2. Intravenous injection combined with obstruction of the ureter.

a) Obstruction of the ureter by ligation. The ureter was drawn up into an incision made in the loin, and ligated after the bacilli had been injected into it, or after they had been injected into an ear vein. The rabbits were killed 6 days later, at which time they showed diffuse inflammation of the kidneys.

b) Compression of the ureter for 15–55 minutes after intravenous injection of bacteria. The ureter was exposed as above, and compressed by fastening a rubber band around it tightly with bull-dog forceps. It is believed that the lesions resulting from this treatment were secondary to hemorrhages caused by over-distension of the veins, the venous return in these cases being blocked by distension of the kidney with urine, during the period of compression. The generalised kidney infection is similar in type to those found post mortem in human beings.

3. Kidney infection following injection of organisms into the adjacent connective tissue, the injections being made intramuscularly into the loin. In no case was there evidence of a direct spread of the infection to the kidney, though one rabbit developed a positive urinary culture 2 days after the appearance of a septicemia, and when killed on the 16th day after the onset of the urinary infection showed, microscopically, marked inflammatory changes in the papilla of each kidney.

These experiments show that when coliform bacilli appear in the urine after intravenous injection, there have usually been accompanying kidney changes, as shown by the presence in the urine of albumen, pus and epithelium, in addition to the bacteria.—I. W. P.

1824. Action of Drugs in Infection. I. The Influence of Morphine in Experimental Septicemia. Adolph Kraft and Neil M. Leitch. J. Pharmacol. & Exper. Therap., Balt., 1921, **17**, 377–384.

Kraft and Leitch performed two sets of experiments both of which disclosed that morphine sulphate in from one-sixth to one-tenth the fatal dose depresses the power of resistance of rabbits to septicemia caused by *Streptococcus hemolyticus*. This baleful effect of morphia is probably to be ascribed to a number of factors, such as inhibition of phagocytosis, intestinal statis with the production and absorption of toxic products, lowering of the temperature, general depression of metabolism and of body defense.

Thus in the administration of morphia, two influences must be considered: its sedative action and its effect on the progress of infection.—F. W. H.

1825. Changes in the Alkali Reserve, Sugar Concentration and Leukocytes of the Blood in Experimental Infections. Edwin F. Hirsch. J. Infect. Dis., Chicago, 1921, **29**, 40–46.

Depression of the alkali reserve occurs in the blood of rabbits following intravenous injection of pathogenic bacteria and this is accompanied by a leukopenia and a hyperglycemia which are apparently proportional to the decrease of the alkali reserve. Subcutaneous injection of carbonate and bicarbonate solutions does not prevent the acidosis. Acid potassium phosphate solutions depress the alkaline reserve with an accompanying decrease in leucocytes and the hyperglycemia which follows the injection of bacteria. The concentration of the sugar of the blood seems to be independent of changes in the number of leucocytes.—L. C. H.

1826. The Absorption of Acacia from the Pleural Cavity of Normal and Tuberculous Rabbits. H. J. Corper and O. B. Rensch. Am. Rev. Tuberc., Balt., 1921, **5**, 49–55.

"With the means applied in this study there was found to be no difference in the absorption of 7 per cent acacia in saline solution, without or containing a suspension of virulent human tubercle bacilli, after intrapleural injection in rabbits both normal or previously sensitized by the subcutaneous or intravenous injection of the same culture of virulent human tubercle bacilli.

"This tends to corroborate the previous observation that there is no greater tendency towards the formation of a pleural effusion following the intrapleural injection of a suspension of tubercle bacilli in rabbits which have been previously sensitized with the same culture of bacilli.

"There is no evidence in our experiments to prove that in the rabbit tuberculous pleural effusions or empyemas were more prone to form in animals previously sensitized with the same culture of living virulent human tubercle bacilli than in those animals which did not receive a sensitizing injection.

"These and previously reported observations do not agree with those of Paterson concerning tuberculous pleural effusions in the rabbit. It is possible that a different reaction may occur in the guinea pig, in view of the generally accepted greater susceptibility of this animal to the allergic reaction. Final judgment on this subject should be reserved pending further observation."—T. G. H.

1827. Variation de la stabilité du Bacille typhique injecté dans le sang du cobaye. (Variation in the Stability of B. typhosus when Injected Intravenously into Guinea Pigs.) Paul Govaerts. Compt. rend. Soc. de biol., Par., 1921, **85**, 245–247.

Great variation in the ability of different animals of the same species to eliminate *B. typhosus* after an intravenous injection was noted. In certain animals but 0.13 per cent of the number of injected organisms could be found in the circulation after one-half hour; in other animals 28.5 per cent were present. Apparently these variations are due in part to the age and nature of the culture injected, and in part to factors individual to the experimental animal. Virulence of the culture is not a determining factor, nor is there any relation between speed of elimination and the agglutinating titre of the serum.—G. H. S.

CHEMOTHERAPY

(*See also Number 1765*)

1828. Quantitative Studies in Chemotherapy. V. Intravenous versus Intramuscular Administration of Arsphenamine. Curative Power and Minimum Effective Dose. Carl Voegtlein and Homer W. Smith. J. Pharmacol. & Exper. Therap., Balt., 1921, **17**, 357–375.

Voegtlein and Smith report experiments on the relative efficacy of the intramuscular and the intravenous administration of arsphenamine and neoarsphenamine in the treatment of experimental trypanosomiasis of rats, and to determine the validity of the ratio of the minimum lethal dose to the minimum effective dose as an index to the curative power of various arsenicals under experimental conditions.

They find the intramuscular method of injection quite as efficient as the intravenous in the treatment of rat trypanosomiasis and that the ratio $\frac{\text{M.L.D.}}{\text{M.E.D.}}$ is a reliable index to the curative effect of the various arsenic preparations tested.

The authors also discuss the practical significance of the therapeutic efficiency of the intramuscular method of administration in reference to the treatment of human syphilis and state that work is in progress in the Hygienic Laboratory to produce a preparation of neoarsphenamine that will be devoid of irritating properties.—F. W. H.

1829. Urinary Antiseptis: A Study of the Antiseptic Properties and the Renal Excretion of 204 Aniline Dyes. E. G. Davis. Am. J. M. Sc., Phila., 1921, **161**, 251–267.

In continuation of his studies upon urinary antisepsis, the author investigated the antiseptic properties and the renal excretion of 204 aniline dyes selected at random. They were first tested for antiseptic value on nutrient agar (neutral to phenolphthalein) in concentrations not greater than 1 to 100 against *B. coli*, *Staphylococcus albus* and *Staphylococcus aureus;* surface seedings (streak) were made on prepared plates with each organism, and those dyes not showing antiseptic properties in the 1 to 1000 concentration were discarded. Only 28 of the dyes showed sufficient antiseptic value to be considered worthy of further tests. This selected group was examined for antiseptic values in both acid (pH 6.4) and alkaline (pH 7.6) urine, again using the same bacteria for test organisms. Dilutions of the dye were made with each urine (adjusted reactions) in sterile test tube; then one series was inoculated with one loopful of a 24-hour broth culture of *B. coli*, and another with *Staphylococcus albus*. After 24 hours' incubation, inoculations were made from each tube to melted agar and plated. The results given by 27 of these dyes were considered sufficiently important to warrant further examination. They were tested for toxicity and excretion properties upon rabbits. Intravenous injections of from 5 to 25 mg. per kilo were given to the animals, and the urine was collected at intervals and examined for the dye. Some dyes were exceedingly toxic, causing convulsions and death in a few minutes after injection; others caused a hematuria or hemoglobinuria following minute doses; some failed to appear in the urine. It was found that of the original total of 204 dyes, only 13 remained which were antiseptic in urine (*in vitro*), which were excreted by the kidney after intravenous administration, and which exhibited no toxic properties following moderate dosage (about 20 mgm. per kilo). Finally this group of dyes was subjected to further tests to determine whether passage through the blood stream and kidney would interfere with their antiseptic properties; also if a sufficient dosage could be safely administered to cause adequate concentration in the urine. Rabbits were given intravenous injections of the dyes, and specimens of urine were taken by catheterization at intervals of from one to several hours after the administration of the drug. A sample of urine was taken in the same way, for control tests, previous to the injection of the drug. Tests for antiseptic value were carried out by placing 1 cc. of urine in each of two sterile test tubes, one of which received one loopful of a 24-hour broth culture of *B. coli;* the other the same amount of a similar culture of *Staphylococcus albus*. These inoculated tubes were incubated for 24 hours, after which 0.1 cc. was transferred to melted agar and plated. The writer states the results of the final test as follows: "In spite of the fact that these several selected dyes approached the ideal requirements (that is, were antiseptic in urine, were excreted by the kidney and were relatively non-toxic), yet they failed at the final test when passed through the blood stream and kidney."

Davis summarizes the results of his studies and gives the following conclusions:

"1. There is no known drug ideally suited for the purpose of internal urinary antisepsis.

"2. Of a total of 204 anilin dyes investigated 61 were found to possess antiseptic properties in agar, and 28 of these were efficient as antiseptics when added to voided urine.

"3. As regards selective action against various organisms, this property was exhibited by no less than 44 dyes, in every case the colon bacillus proving more resistant than the staphylococci. There were only 24 which inhibited the colon bacillus in urine in a dilution of 1 to 1000.

"4. There was almost no exception to the rule that antiseptic action was exhibited in higher dilution in alkaline urine than in acid urine. Attention is therefore called to the fact that these dyes are most efficient in urine of a reaction which renders urotropin inert.

"5. The azo dyes give no promise of value, since of 37 of this group studied only 3 possessed antiseptic properties, and these only to a slight degree.

"6. Of the triphenylmethanes many were antiseptic in high dilution in urine (some in dilution greater than 1 to 1,000,000). Of these, however, all but one were toxic and none was excreted by the kidney. This group is, nevertheless, worthy of further investigation.

"7. Of 21 dyes of the xanthane group 3 were antiseptic in voided urine, and 2 of these were excreted to a moderate degree.

"8. Of 4 acridine dyes 2 were antiseptic in urine. Neither was excreted.

"9. Of 9 dyes of the azine group 5 were antiseptic in urine, and 3 of these (Safranin T, Safranin OW, Safranin MN) were excreted by the kidney with great rapidity and completeness and were non-toxic in 20 mgm. per kilo dosage.

"10. By a study of 204 anilin dyes, chosen at random, it has been possible to select 15 which are (a) antiseptic in urine, (b) excreted by the kidney and which are (c) relatively non-toxic. With only two of these, however (proflavin and acriflavin) was it possible to demonstrate the secretion of antiseptic urine following intravenous administration.

"11. Considering that rapid renal elimination of anilin dyes is not unusual; that there are not a few dyes, relatively non-toxic, which exert a bacteriostatic action when diluted to infinitesimal amounts in voided urine; and that out of 204 dyes it has been possible to select 15 which approach the ideal and 2 which are experimentally effective; it is within reasonable expectation that a dye clinically suited for use as an internal urinary antiseptic may be discovered or synthesized. Experiments to date indicate that dyes of the triphenylmethane, xanthone, acridin and azin groups (particularly the latter) give more promise of value."—L. W. F.

1830. A Comparative Study of the Trypanocidal Activity of Arsphenamine and Neoarsphenamine. J. F. SCHAMBERG, J. A. KOLMER AND G. W. RAIZISS. Am. J. M. Sc., Phila., 1920, **160**, 25–36.

Experiments on test animals show that arsphenamine and neoarsphenamine exert a trypanocidal action *in vivo*, therefore it is probable that these substances are also curative in syphilis. To determine the curative properties of these two drugs a comparative study was undertaken by using rats infected with a virulent strain of *T. equiperdum*. A uniform method, standardized relative to certain factors, as virulence of test organism, method of infection, dosage, interval between infection and treatment, weight of test animal was employed. By this method, the writers found among other results that with the particular strain of *T. equiperdum* used in the tests, that the minimum amount of arsphenamine to sterilize rats infected 24 hours previously, varied from 0.010 to 0.030 gm. per kilo of body weight, with a general average of 0.023 gm. per kilo for 21 preparations made by 6 different laboratories. Under identical test conditions, the minimum amount of neoarsphenamine giving equivalent results varied from 0.020 to 0.040 gm. per kilo weight of rat, with a general average of about 0.040 gm. per kilo in a series of tests upon 22 preparations from 6 different laboratories. The trypanocidal activity of arsphenamine was found to be 1.7 times greater than that of neoarsphenamine. In accordance with these results, 0.6 gm. arsphenamine equals 1.05 rather than 0.9 gm. of neoarsphenamine in therapeutic activity. The trypanocidal activity of the different lots of the compounds from various sources varied in a manner analogous to variations in lethal toxicity for rats.

The authors give full details of the tests with tables of data showing the results derived from the different series—L. W. F.

1831. The Therapeutic Significance of the Gram Reaction. JOHN W. CHURCHMAN. Johns Hopkins Hosp. Bull., Balt., 1921, **32**, 225–227.

Churchman cursorily reviews his prevous work on the bacteriostatic action of gentian violet and other members of the tri-phenyl-methane group, presents evidence that at least chemical affinity is not the only factor involved in the selective bacteriostatic property of gentian violet and briefly calls attention to the clinical significance of the Gram reaction.—F. W. H.

1832. Grundsätzliches zur Frage der Abortivheilung der Syphilis. (Fundamental Considerations on the Abortive Treatment of Syphilis.) MEIROWSKY AND S. R. LEVEN. München. med. Wchnschr., 1921, **68**, 106.

The early treatment of primary seronegative syphilis with salvarsan is the best and most direct guarantee of successful cure.—B. C.

1833. Weitere Mittheilungen über die Wirkung des Silbersalvarsans unter besonderer Berücksichtigung der Wassermannschen Reaktion und der Nebenerscheinungen. (The Effect of Silver Salvarsan with Special Regard to the Wassermann Reaction and the Side Phenomena.) H. SOLTMANN. Berl. klin. Wchnschr., 1921, **58**, 9–11.

Silver salvarsan has a favorable action on the clinical symptons and upon the Wassermann reaction. Its use makes possible the omission of mercury from the therapy. The technic of administration is somewhat more difficult than that of neosalvarsan. Another disadvantage is the more frequent occurrence of disagreeable side-reactions.—B. C.

1834. Ueber gehäuftes Auftreten von Enzephalitis nach Neosalvarsan. (The Increased Occurrence of Encephalitis after Neosalvarsan.) FRITZ REIF. München. med. Wchnschr., 1921, **68**, 14–15.

After 9000 successful salvarsan injections, there occurred 4 cases of encephalitis that seemed traceable to the salvarsan used. Just what happened to this lot of salvarsan can only be conjectured. Minute cracks in the ampules might have allowed oxidation of the drug.—B. C.

MISCELLANEOUS

1835. The Capacity for Phagocytosis Shown by Polymorphonuclear Leucocytes in Dead Animals and after Preservation in Salt Solution. HOWARD B. CROSS. Johns Hopkins Hosp. Bull., Balt., 1921, **32**, 238–240.

Cross finds that polymorphonuclear leucocytes at times take up and digest bacteria within the body after death; that suspended in physiological salt solution, if a trace of serum be present, they may remain alive and manifest active phagocytosis for a considerable time; that after removal from the body they may withstand marked changes of temperature without destruction and often without any alteration of their phagocytic powers; that phagocytes from the blood and exudates apparently are endowed with equal tenacity of function and that human phagocytes are capable of sustained independent existence.—F. W. H.

1836. *Hyperglycemia in its Relation to Immunity.* G. L. ROHDENBURG AND H. F. POHLMAN. Am. J. M. Sc., Phila., 1920, **159**, 853–866.

In a study of the question of hyperglycemia, the authors found that a temporary hyperglycemia accompanied the injection of various organic and inorganic substances in experimental animals, and also in man. No specific type reactions followed the injection of any given substance, nor occurred when any one of the endocrine glands was removed. But it was found that repeated injections of the same substance produced a gradual rise of the blood sugar, which paralleled the formation of agglutinins or lysins. After the maximum of antibody production was reached, further injections of the substance used failed to cause a rise in the glycemic reaction. The hyperglycemia following these injections reaches a certain level of sugar concentration in the blood, where it remains for a short period, then falls to the normal level even though the immune bodies are still present in the blood. The substances (antigens) used in the immunity experiments were typhoid vaccine and sheep red blood cells. No definite explanation of the hyperglycemia in this connection could be made, although it was suggested that it might be due to temperature variations following the injection of foreign proteins, or to the breaking up of protein occurring during the process of antibody formation. The authors also suggest as a practical test of the maximum point of antibody formation in an individual or animal, the absence of hyperglycemia following the injection of a substance known to give this reaction.—L. W. F.

1837. *Fettstudien.* (*Studies upon Fats.*) H. MUCH AND H. SCHMIDT. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, Teil I, Orig., 1921, **31**, 169–200.

The authors express the opinion that it has been established that lipoids and bacterial fats act as antigens and stimulate the production of antibodies when injected into animals. The studies reported in this paper relate to neutral fats from animals or plants.

The first section of the paper deals with the effect of light and air on animal fats. Light, from the violet region of the spectrum, in the presence of oxygen alters both the color and taste of these fats.

The second section reports the results of studies on the influence of neutral fats on bacterial growth. All the fats used, with the exception of chaulmoogra oil, increased the growth of most of the usual pathogenic bacteria on agar containing fats. The Gram-staining and pigment formation of these bacteria were not altered by growth on fat-media. The bacteria, however, altered the fats in the media, splitting them to simpler compounds.

The third section is devoted to the effects of the parenteral introduction of fat in animals. Neutral fats from animals and plants are very slowly absorbed from the subcutaneous tissue and peritoneal cavities of the animals into which they are injected. Hypersensitivity to injections of fat was never observed, although second injections of fats in guinea pigs were made at various intervals up to 2 months.

In the fourth section, the attempts to demonstrate antibodies to neutral fats are described. A reaction at the site of the first injection never followed a second injection. Complement fixation tests were negative, and the precipitating action of serum on an emulsion of fat was not different in animals which had received many injections of fat from the effect of the serum of a normal animal.

The authors suppose that these neutral fats are simpler substances than bacterial fats, and hence do not act as antigens.—S. B-J.

1838. *Der "trockene Tropfen" als seroskopische (kolloidoskopische) Methode.* (*The Dried Drop as a Seroscopic or Colloidoscopic Method.*) H. DOLD. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, Teil I, Orig., 1921, **31**, 161–169.

A drop of a fluid mixture containing colloids and crystalloids, such as serum, spinal fluid, exudates or transudates, is placed with a platinum loop on a clean glass slide, the slide inverted, and the drop then dried quickly in a desiccator. Under the microscope, with the condenser removed, the dried drop shows a structure, which the author believes may have some significance in the interpretation of serological tests. While all the dried drops from the same fluid do not have an identical structure, they are similar. Photographs are reproduced showing the different structures formed by spinal fluid, serum and fluid from Wassermann tests.—S. B-J.

1839. *A Decalcifying and Dehydrating Fixative.* C. E. JENKINS. J. Path. & Bacteriol., Edinb., 1921, **24**, 166–167.

Exception is taken to the use of picric and nitric acids for the decalcifying of tissues because (1) they stain the tissue and are difficult to remove, (2) they enter into combination with the chromatin of the nuclei, so that hematoxylin can not stain them well and (3) washing them out entails much delay before the specimen can be examined.

The following formula, based upon Carnoy's fluid, is designed to avoid these difficulties:

Hydrochloric acid	4
Glacial acetic acid	3
Chloroform	10
Water	10
Absolute alcohol	73

The tissue should be immersed in 100 times volume of solution. Sections show no discoloration, except some bleaching, which does not affect the staining. Decalcification is rapid, a piece of rib 2 inches long becoming quite soft in 48 hours. After decalcification, washing is not necessary, the tissue being passed directly into absolute alcohol to complete dehydration and remove the acid. The alcohol should be changed once or twice, a piece of tissue 1 cm. by 1 cm. by 4 mm. requiring about 8 hours in it, after which it may be passed through chloroform into paraffin as usual. The tissue will take Ehrlich's acid hematoxylin as do ordinary non-bony tissues fixed in formalin, and differentiation is normal.—I. W. P.

1840. Bau der roten Blutkörperchen und Hämolyse. (*Structure of Erythrocytes and Hemolysis.*) H. Bechhold. München. med. Wchnschr., 1921, **68**, 127–130.

The dark field with arc illumination was used in observing the structural changes of normal and hemolyzing erythrocytes. The normal red cell consists of a framework (somewhat like the net of a balloon) of hydrated protein sheathed over with an adsorbed layer of mixed lecithin and cholesterol saturated with physiological NaCl. Osmotic effects of hypo- and hypertonic solutions are assigned a minor rôle in the process of hemolysis. The lipoid sheath possesses a considerable independence of the concentration of salt in balanced salt solutions.

Hemolysis is the result of the disturbance of the three-component system: hydrated protein, hydrated lecithin, cholesterol. Anything that disturbs the relative hydration of the lecithin or protein must cause hemolysis, as well as anything that affects the solubility of the cholesterol in the lecithin. Descriptions are given of the consecutive phenomena observed in hemolyzing erythrocytes and partially similar artificial structures.—B. C.

1841. Zur Differentialdiagnose zwischen Perichondritis laryngis and Thyreoiditis bzw. Srtumitis. (*The Differentiation between Laryngeal Perichondritis and Thyroiditis or Strumitis.*) Marcus Maier. Berl. klin. Wchnschr., 1921, **58**, 230–232.

The clinical features and post mortem findings are given for a case under observation.—B. C.

1842. A Method of Mounting Flat Pathological and Other Specimens in Gelatin. T. H. G. Shore. J. Path. & Bacteriol., Edinb., 1921, **24**, 140–144.

This method was developed because of the increased cost of materials for the mounting of museum specimens and the impossibility of obtaining glass jars, since the war. It is somewhat similar to a method described in 1919, by Kelley Hale.

Specimens are prepared in a modified Kaiserling's solution, 10 per cent instead of 15 per cent formalin being used in the first solution, which is rendered neutral to litmus before use by the addition of caustic soda, to offset in it the subsequent production of formic acid. Instead of potassium acetate in the final solution, in which specimens soak before gelatin mounting, 40 or 50 per cent glycerine is used, with a trace of thymol. In this fluid specimens are stored until a batch has been collected for mounting.

The mounting chamber consists of a piece of strong window glass (22 oz. to the sq. foot), with ground edges, measuring about 6 by 3.25 inches, on which is erected, by the use of glass rods, fastened to the glass plate with white enamel, a compartment 4.25 by 3.25 inches, or one 3.25 inches square. Heating for some hours in the paraffin oven will make the rods set firmly in the enamel. The corners are than made water tight with enamel, and the chamber again heated. It is then filled with a 10 per cent gelatin solution to which about 20 per cent of glycerin has been added, after clearing with egg white. The specimen to be mounted (not more than 5 mm. or so in thickness) is lowered into the gelatin, care being taken to avoid bubbles. The gelatin is allowed to harden, and then painted with strong formalin, to prevent any subsequent softening. After the formalin has thoroughly penetrated it, more gelatin is poured over the surface, and a cover glass the same size as the chamber placed over it. When the gelatin has hardened, the edges of the chamber are again coated with enamel, and afterwards filled in evenly with a cement consisting of white lead and gold size, made into a smooth and fairly stiff paste. When the cement has set (1 or 2 days), it is smoothed off with a sand paper and a final coat or two of enamel given the edges. In the finished mount, the glass rods used for making the sides of the chamber should be quite hidden.—I. W. P.

1843. Le Mecanisme de la formation du cal. Son application au traitement des Pseudarthroses. (*The Mechanism of Callous Formation. Its Application to the Treatment of Pseudoarthroses.*) Léon Imbert. Presse méd., Par., 1921, **29**, 403.

Theoretical considerations lead to the view that: "The lesion (fracture) produces . . . . a ferment which is transported throughout the body by the blood and stimulates powerfully certain glands, especially the thyroid; these react by the formation of hormones . . . . which endow the site of the fracture with the power of callous formation." Three injections (mode not stated) of the serum of a recent fracture case produced healing in a patient with fracture of the thigh refractory to other methods of stimulating healing.—L. A. K.

BOOK REVIEWS

1844. The Yeasts. Alexander Guilliermond. Translated by Fred Wilbur Tanner edition of 1912. John Wiley & Sons, Inc., New York.

Tanner's translation of the monograph by Guilliermond follows the original closely in many of its chapters. It departs from the original and becomes a revision in the chapters on "The Physiology of the Yeasts." The presentation of this translation in English performs an appreciated service to many students of these problems to whom the French edition is rather difficult reading. The translator has, therefore, performed a service, especially to the American student in bringing ready access to the large amount of information which is in Guilliermond's book. This author is one of the few men who has given extensive attention to the yeasts and is still rapidly adding to our knowledge of this group of organisms. A scrunity of the form in which the descriptions of yeasts are presented leads to the regret that Guilliermond should not have standardized a method of describing yeasts. The characterizations as found are discursive rather than strictly technical with the discursive matter as notes. The form of the description is not systematized to present a tangible method of attack in identifying members of these groups. As in all of the author's papers much attention is given to cytological detail, some of which is peculiar to the author's theory of cell organization.

One exceedingly useful feature of this book is found in the full citation of the literature of the subject at the bottom of the page. This renders extensive research literature of fermentation immediately available to the worker who uses the text. The whole constitutes a book of 434 pages in 13 chapters whose titles are Morphology and Development of the Yeasts; Cytology of Yeast; Physiology, Nutrition, Respiration, and Alcoholic Fermentation; Origin of the Yeasts; Their Position in Classifications of the Fungi and Their Systematic Relationships; Methods of Culture and Isolation of Yeasts. Procedures for Observation; Methods for the Characterization and Identification of Yeasts; Variation of Species; Classification of the Yeasts; Family of Saccharomycetes; Family of Non-saccharomycetes or Doubtful Yeasts; Pathogenic Yeasts; and Fungi Relating to the Yeasts.

The translator has followed the French text too literally in many cases with resultant injury to clearness. Idiomatic phrases are often literally translated where their entire omission would have made better English. Occasionally serious errors occur in the actual sense of the translation. For example, this sentence "Division is not observed as we have seen in the Schizosaccharomyces." This sentence also illustrates the French use of the definite article before generic names which occurs frequently. Numerous errors in details of English are found. The word ascus has been contracted to asc, an unusual usage. It is to be hoped that in case this book reaches a revision, the faults of translation will be eliminated.—C. T.

1845. Précis de Microscopie. M. Langeron. 3 ed. entirely revised. Masson & Co., Paris, 1921, 916 pp. and 293 text figs. 34 frs.

Note should be made of the appearance of the third edition of this invaluable guide to microscopic technique, experimentation and diagnosis. It contains some hundred pages more than the second edition and has been brought thoroughly down to date.

While the work as a whole forms a most satisfactory laboratory reference book, its unique value lies in the portion devoted to special methods.

Under this heading are discussed the collecting, rearing, and preservation of the more important protozoan, helminth and arthropod parasites of man and the higher animals. The methods given are those which have been tried out and in many cases developed by the author in the course of years of experience.

Other topics treated in an especially helpful manner are those of the examination of the blood and other organic fluids; methods for physiological injections, and the technique of medico-legal microscopy.

Chapters are devoted to a brief resumé of bacteriological and mycological technique as well as to plant histology and cytology.—W. A. R.

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THIS NUMBER CONTAINS SUBJECT INDEX FOR VOLUME IV

VOLUME V NUMBER 10

ABSTRACTS
OF
BACTERIOLOGY

UNDER THE EDITORIAL DIRECTION OF THE
SOCIETY OF AMERICAN BACTERIOLOGISTS

OCTOBER, 1921

EDITOR
A. PARKER HITCHENS

It is characteristic of Science and Progress that they continually open new fields to our vision.—PASTEUR

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ABSTRACTS OF BACTERIOLOGICAL LITERATURE

HISTORY, BIOGRAPHY, LITERATURE

1846. Louis Matruchot. Paul Portier. Compt. rend. Soc. de biol., Par., 1921, **85**, 322–323.
An obituary notice and expression of appreciation of the work of Professor Matruchot. Particular mention is made of his work upon plant biology, especially his investigations upon the cryptogams.—G. H. S.

CHARACTERIZATION AND CLASSIFICATION

1847. So-Called Pleomorphic Streptococci from Human Respiratory Tract. John F. Norton, Katherine Rogers and Contantine Georgieff. J. Am. M. Ass., Chicago, 1921, **76**, 1003.
Any strain of streptococcus from the mouth may show pleomorphism when grown for a sufficient length of time on artificial media. This applies to hemolytic and green producing strains. The pleomorphism is probably the result of unfavorable conditions for growth.—P. G. H.

1848. Classement par types de méningocoques isolés au Danemark. (*The Types of Meningococci Isolated in Denmark.*) Ferd. Wulff. Compt. rend. Soc. de biol., Par., 1921, **85**, 387–389.
Agglutination and agglutinin absorption tests were performed upon 283 strains of meningocci isolated in Denmark for the purpose of type determination. Of this number of strains, 50 were derived from the spinal fluid, 220 strains from the throat, and 13 from cases showing a meningococcemia without meningitis. The strains were derived from 268 individuals. Division of the strains into 5 types was accomplished, with the following distribution:

	SPINAL ORIGIN	PETECHIAL ORIGIN	FAUCIAL ORIGIN	TOTAL
Type A	46	13	93	152
Type B	1	0	0	1
Type C	1	0	0	1
Type D	1	0	2	3
Type E	1	0	5	6

All of the known pathogenic strains could be placed within these 5 types. The remaining strains obtained from the throat failed entirely to fall within any system of grouping.—G. H. S.

1849. Étude comparative sur les Méningocoques, types Anglais et Danois. (*Comparison of English and Danish Types of Meningococci.*) Ferd. Wulff. Compt. rend. Soc. de biol., Par., 1921, **85**, 620–622.
Certain strains of meningococci isolated in Denmark (see Abstract No. 1848) were compared with the 4 types as determined by Gordon. None of the Danish strains which were pathogenic could be placed in Gordon's Type I, although many of the non-pathogenic throat strains belonged to this type. One of the pharyngeal, non-pathogenic strains appeared to be closely related to Gordon's Type II. Gordon's Type III is rare in Denmark, but a single strain was found. Strains belonging to Gordon's Type IV were not found. It is of great interest that the types pathogenic in England appear to be without pathogenesis in Denmark, and that the type most frequently found in meningitis (in 95 per cent of the cases) in Denmark is of no importance in England.—G. H. S.

1850. Recherches relatives a la question des Méningocoques-types. (*The Question of Types of Meningococci.*) Ferd. Wulff. Compt. rend. Soc. de biol., Par., 1921, **851**, 623–624.
Comparison of different cultures secured from different locations (blood, spinal fluid, throat) in single cases showed that they were all of the same type in any given case. Repeated tests upon strains after prolonged cultivation (2 to 21 months) showed that the type characteristic is a fixed property. In healthy carriers the meningococcus (Type A) has been shown to persist in the nasopharynx for 3 months; in convalescents this same type has persisted for 7 months.—G. H. S.

1851. Untersuchungen über eine Klassifikation der Sarzinen auf Grund ihres kulturellen und morphologischen Verhaltens auf den verschiedensten Nährböden. (*Studies on the Classification of Sarcinae, on the Basis of their Cultural and Morphological Behavior on Various Media.*) KURT BOERSCH. Inaug. Dissert., Hannover. 46 p. 1920. Ref. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1920, **52**, 309–311.

The author believes that the Sarcinae form an independent, well characterized genus, and are easily differentiated from the micrococci. The true packet formation is either always or occasionally present, or is entirely absent: an organism must be classified with the Sarcinae even with only occasional packet formation, otherwise it belongs to the micrococci. The differentiating criterium must, therefore, now and then be spoken of as latent. Complement fixation offers further proof as to the biological and chemical differences between Sarcina and micrococcus.

Gelatin liquefaction, turbidity and character of growth (formation similar to tresses of hair) in bouillon, coagulation of milk, and coloration of liquid media containing litmus, can be used for the differentiation of the Sarcinae; the individual stems of the 4 groups of Sarcinae differentiated by the author behave on these substrata quite distinctly and show characteristic properties, which can be used as a basis for a proper classification. The original work should be consulted for the details of the experiments.—S. A. W.

1852. Bildet Mycobacterium smegmatis L. und N. eine eigene Art oder ist es nur ein Corynebacterium pseudodiphtheriticum? (*Does Mycobacterium smegmatis form an Individual Species or is it only a Corynebacterium pseudodiphpheriae?*) H. U. HARTMANN. Schweiz. med. Wchnschr., 1921, No. 28, 657–685.

Studies upon the acid-fast properties of *B. smegmatis*, particularly upon the loss of this characteristic upon artificial cultivation, showed that acid-fastmess could always be demonstrated if the organisms from culture were mixed upon the slide, with slight heating, with a fat. Lanolin proved most satisfactory for this purpose. Incidentally it was noted that pseudodiphtheria bacilli treated in the same way also showed acid-fastness. From these observations it is concluded that *B. smegmatis* shows an acid-fast reaction only because it has been in contact with fat-containing material in the secretions and that primarily the organism is non-acid-fast, probably belonging to the pseudodiphtheria group.—G. H. S.

BACTERIAL NUTRITION AND METABOLISM

1853. Growth Accessory Substances in the Nutrition of Bacteria. T. THJØTTA AND O. T. AVERY. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 197–199.

Thjøtta found, in previous studies, that the mucoid material from cultures of Friedländer's bacillus and other closely allied organisms contained growth accessory substances which would replace blood and blood derivatives in the cultivation of *B. influenzae*. He found that these growth accessory substances were present in both the saline suspensions and watery extracts of the heat killed cultures. Boiling for 10 minutes and filtering through Berkefeld candles did not destroy or retain the growth-inducing principles. It was thought that these substances might belong to the class of the so-called vitamines. The present study was made to determine the nature of these growth accessory substances from bacterial extracts, and their relationship to vitamines. Extracts were prepared from different materials, known to contain vitamines such as yeast, fresh tomatoes, green peas, and string beans. Extracts from these materials, when added to broth, greatly accelerated the growth of *B. influenzae* and the pneumococcus. A seeding too small to produce growth in plain broth alone will suffice to induce abundant growth if a small amount of the extract containing the accessory growth substance is added to the same medium. *B. influenzae*, when seeded from blood media to plain broth containing yeast extracts, grew luxuriantly, but not at all if put in plain broth. Under these conditions, dilutions of 1:1000 of the extracts containing the growth accessory substances sufficed to stimulate growth of the organisms. But broth containing only yeast or vegetable extracts failed to sustain growth for more than one or two transfers. Since *B. influenzae*, the organism used in this study, has been considered an obligative hemophile, it was thought that perhaps some other substance might be carried over from the original blood culture in an amount sufficient to supplement the yeast broth and aid the growth on latter medium. The failure in subsequent transfers might be due to some necessary substance in the blood which is exhausted by growth or lost by dilution. This blood substance is referred to as the X factor, and the vitamine-like substances in the extracts as the V factor. Neither of these substances by itself can sustain the growth of *B. influenzae*, both being essential for this result. Apparently both of the substances are present in blood. It was found that the vitamine-like substances had their growth properties destroyed by autoclaving. Autoclaving of blood medium also destroys its ability to support the growth of *B. influenzae*. If the autoclaving of the blood medium did not destroy the X factor, the autoclaved blood medium could be reactivated by the addition of fresh yeast extract and allow the influenza bacillus to grow. This was found to be the case. Therefore the X factor is heat stable, while the V factor is thermolabile to a certain extent, although it resists boiling for at least 10 minutes. Investigations are being continued on X substances to see if it is found elsewhere than in body tissues. Crystalline hemoglobin contains some of the X factor, but not the V factor, as demonstrated by the fact that when it is added to plain broth, it fails to support the growth of *B. influenzae*.—L. W. F.

1854. Observations on Bacterial Metabolism. J. H. MUELLER. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 14–17.

In an investigation on the cultural requirements of certain of the pathogenic bacteria, a substance was found in an infusion of beef, beef heart, casein and certain other proteins that contains a hitherto undescribed component which is essential to the growth of the hemolytic streptococus and probably the pneumococcus. It is absorbed from the beef infusion by charcoal, and precipitated from the casein in an impure form by mercuric sulphate. As yet, the chemical nature of the substance has not been determined.—L. W. F.

1855. Studies on Atmospheric Requirements of Bacteria. I. Wa'er Vapor Tension. N. KOPELOFF AND S. MORSE. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 308–310.

In an investigation upon the effect of water vapor tension on surface colonies developing on a solid medium, the writers poured medium in one part of a Petri dish which was inverted edge to edge over another of equal diameter containing a dehydrating agent; the two parts were fastened by passing adhesive tape around the entire circumference, thus giving practically an air tight capsule. The medium, consisting of a glucose infusion agar (pH 7.0) was poured to a depth of 2 mm. in the dish, and seeded with either *B. coli*, *B. subtilis*, *Staphylococcus aureus*, or *Streptococcus hemolyticus*. The poured agar plate was seeded by spreading 0.1 cc. of a dilution of broth culture of the organism over the entire surface. The following dehydrating solutions were used: glycerin, 50 per cent, 50 per cent calcium chloride solution (saturated), and 25 per cent calcium chloride, giving initial relative humidities of 0, 25, 35, and 75 per cent, respectively, at the start of the experiment. The dehydrating solutions were poured in the lower dish of the capsule to a depth of 5 mm., and as a rule a space of about 2 cm. separated the two surfaces-dehydrating fluid and the agar medium. The growth of all organisms investigated showed marked inhibition under these conditions. The action was greater on the more delicate types, but was found roughly proportional to the degree of dehydration produced. The character and appearance of all colonies were greatly modified by a change in the variable. It was found that a relatively slight departure from saturated conditions is of considerable importance in bacterial surface cultures. —L. W. F.

1856. On Certain Poisonous Substances Produced in Bacterial Cultures. H. ZINSSER, J. T. PARKER AND A. KUTTNER. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 49–56.

The writers describe a substance which they designate as "X" found in bacterial cultures of different organisms grown on various media. They consider it as an entity existing independently, not an exotoxin nor an endotoxin, or extractive substances from the bacterial cell, possessing toxic properties for rabbits, and for guinea pigs to a lesser extent. The general nature of the toxic effects, the incubation period, etc., were the same irrespective of the organism employed, and the medium upon which it was grown. Specific immunological reactions were not produced. No characteristic lesions were found in the animals which died from its toxic effects. These substances show heat instability,—they appear in young cultures with apparent diminution as the cultures grow older. Such characteristics make it very questionable if these bodies are split products of the constituents of the media. No experimental evidence exists to show that these "X" substances are produced within the animal body during the growth of streptococci or other bacteria.—L. W. F.

1857. Growth-Determining Substances in Bacteriological Culture Media. J. H. MUELLER. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 225–228.

Mueller, in a previous study, found that a peptone-free meat infusion broth would produce an abundant growth of hemolytic streptococci. If such a meat infusion broth be boiled with charcoal, it was found that it lost its property of producing a growth. But if commercial peptone or a sulphuric acid hydrolysate of certain proteins (casein, or meat) be added to the charcoal-treated broth, heavy cultures of the streptococci could be obtained. Neither one of these alone gave the slightest trace of growth. The activating material in the protein hydrolysate was precipitated by mercuric sulphate, but could not be identified as any of the amino acids known to be precipitated by this reagent.

In the present investigation, the further purification of the previously reported activating material has been described. Much of the work has been done upon a commercial preparation called "aminoids"—an enzyme digest of milk products, biuret free. But every step in the separation has been checked on an acid hydrolysate. No essential differences in the factors involved could be distinguished. It was found that there were two factors in the mercury sulphate precipitate, both of which were necessary to reactivate the charcoal-treated infusion. One of these factors is designated "X", the other as the "Y" factor. A full outline of the methods and the technic employed in this investigation is given, with a discussion of the results. Mueller states relative to the streptococci, that "there are at least three factors, still unidentified, which determine growth; namely, some substance in the charcoal-treated infusion, the "X" fraction, and "Y" fraction."—L. W. F.

1858. Action du chlorure de manganèse sur la production de la toxine diphtérique. (Effect of Manganese Chloride upon Toxin Production by Bact. diphtheriae.) L. E. WALBUM. Compt. rend. Soc. de biol., Par., 1921, **85**, 619–620.

The effect of $MnCl_2$ upon toxin production by *Bact. diphtheriae* is presented in tabular form:

CUBIC CENTIMETERS OF N $MnCl_2$ PER LITER	pH OF THE TOXIN	TOXIN UNITS PER CUBIC CENTIMETER
0	8.20	111
0.0001	8.20	143
0.0003	8.20	154
0.001	8.05	167
0.003	8.00	222
0.01	8.15	667
0.03	7.75	125
0.1	8.10	50

—G. H. S.

1859. Variations in the Streptolysin Curve in Serum Media. F. A. STEVENS AND C. L. LAMAR. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 265–266.

Hourly titrations of the hemolysin produced by the growth of hemolytic streptococci in serum medium show a gradually ascending curve of concentration; the maximum is reached between the 6th to 12th hour, followed by a rapid fall. The character of the culture used to seed the media, the quantity of serum present, the source of the sera, and the amount of peptone in the broth modifies the curve. Variations in concentration of hemolysin, and the time that hemolysin first appears in the culture and when the maximum is reached, depend upon those factors. Variations are brought out with similar seedings and the introduction of only one variant in the experiment. Rabbit serum media allow the production of the lysin sooner but not in as great concentration as horse serum when these sera are used in 20 per cent concentration in peptone-free broth. Greater variations in the maximal hemolysin titre occur with lower percentages of these sera when seeded with different plain broth cultures. Practically constant titers are given at the same time during the growth when 20 per cent horse serum is added. The time relationships hold in all concentrations. The titre is slightly increased on the addition of 2 per cent peptone, and with 20 per cent horse serum gives identical titers. With rabbit serum media the variations are brought within closer limits. The delay in lysin production in horse serum indicates a lag in the rate of multiplication of organisms during the early hours of seeding, since time relationships are directly dependent on the growth of the streptococci. All streptococci of human origin (virulent or avirulent) reach the same condition in regard to growth and number at the end of 16 hours, when seeded upon a 20 per cent horse serum in a 2 per cent peptone broth. Seedings from such a culture obviate the variations in the nature of the seedings for experimental purposes, unless agglutination has occurred.—L. W. F.

1860. The Peptolytic Enzymes of Hemolytic Streptococci; Methods. R. WEST AND F. A. STEVENS. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 234–236.

The writers outline a procedure by which the active proteolytic substance is obtained from the bacterial cells. This method was employed in their studies pertaining to the action of streptococci on certain protein fractions, and yielded a sterile product containing the active enzyme. The test organism used was a beta type of streptococcus of human origin. The substrate used in the experiments was a 1 per cent solution of a specially prepared commercial peptone. The sterile enzymes were added to the sterile peptone, under various experimental conditions, and incubated at 37°C. for 48 hours. The sterility of the experiments was proved by broth cultures. The increase in amino N was determined by the micro apparatus. It was found that "the increase in amino nitrogen with various enzyme preparations has varied from 14 to 26 mgm. per cent. By varying the H-ion concentration of the solutions a maximum activity was found at pH 7.0 with a decrease in both the alkaline and acid sides of neutrality. The acid endpoint of activity was about pH 4.5. It was further found that heat destroyed the enzyme very readily. At a temperature of 56°C. for 10 minutes in the absence of substrate, the enzyme deteriorated to such an extent that only a few mgm. of amino nitrogen were obtained by its action. Higher temperatures completely destroyed it. Concentration curves at the optimum H-ion concentration approximated the usual curves for enzymes."—L. W. F.

1861. L'action de divers sels métalliques sur la production de staphylolysine. (*Influence of Different Metallic Salts upon the Production of Staphylolysin.*) L. E. WALBUM. Compt. rend. Soc. de biol., Par., 1921, **85**, 376–377.

A large series of salts were tested for their effect upon staphylolysin production. The salts of Mg, Mn, Ni, Cd, Au and Pt favored lysin production, while many others, Ca in particular, inhibited its formation. The salts used, the concentrations tested, and the results secured are presented in detail.—G. H. S.

1862. The Viability of B. typhosus in Alkaline Bile in Vivo. T. D. BECKWITH. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 36–38.

Since Nichols has suggested the use of alkaline therapy in the treatment of human carriers of *B. typhosus* for the purpose of eradicating the organism within the gall bladder, the writer reports his observations on the hydrogen ion concentration of the bile of experimental rabbit carriers, and the relation of the data obtained to the therapeutic problem. Beckwith employed the method of Clark and Lubs with the comparator block to determine the pH of bile, both from infected and from normal rabbits. After exsanguination, the readings were generally made within three-quarters of an hour; in the meantime, the bile was kept in the closed syringe or small bore agglutination tube to prevent loss of dissolved gases. Rabbit carriers were prepared by the method of Gay and Claypole; two weeks were allowed to elapse after inoculation to permit physiological adjustment of the animal; moreover no animal was classed as a carrier unless *B. typhosus* was isolated subsequently from the bile. The results of the experimental data obtained were summarized as follows:

"(1) Bile from carrier rabbits of *B. typhosus* shows a lower hydrogen ion concentration than that from normal animals. In the first the general mean was 8.33 while the latter gave 7.41.

"(2) *B. typhosus* is viable *in vivo* in rabbit bile even when the hydrogen ion concentration is depressed to pH 9.4."—L. W. F.

1863. The Bactericidal Action of Rabbit Bile on Certain Strains of Streptococci. R. L. **Stone.** Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 34–36.

During the course of a series of experiments on rabbits to determine the pathogenicity of a certain strain of hemolytic streptococcus, Stone found in these animals at autopsy that the various organs of the peritoneal cavity were filled with living streptococci, while the bile was always sterile. Tests were made *in vitro* with bile from other rabbits and from various animals against the same strain of streptococci to find out whether they also possessed bactericidal properties. It was found that all samples of rabbit bile were bactericidal against the particular organism, but samples of the bile of the ox, sheep, cat, dog, pig, guinea pig, and human exerted no deleterious effect on the streptococci. The strain used in these preliminary experiments was, according to Holman's classification, *Streptococcus pyogenes*—a hemolytic, non-mannite fermenting streptococcus.

Tests were continued on various strains of streptococci from human and animal sources, which were classified in 3 groups according to their hemolytic and sugar fermenting properties. The results of these tests are summarized as follows:

"I. All those hemolytic non-mannite fermenting streptococci which fall, by Holman's classification, into the *Streptococcus pyogenes* group, were killed by rabbit bile, $\frac{1}{50}$ of 1 cc. of bile, or less being sufficient to kill 0.1 cc. of a 24-hr. serum broth culture. About twenty cultures of this type were tested.

"II. All non-hemolytic streptococci, whether of human or bovine origin, were unaffected by rabbit bile.

"III. Hemolytic, mannite fermenting streptococci are *almost* always unaffected by rabbit bile. In a group of thirty or more of such strains tested, only two were killed by bile."

The bactericidal power of the rabbit bile was found to be undiminished by sterilization; also, a purely bactericidal phenomenon, and not a lytic process, since the bacterial bodies were visibly intact even after 48 hours' exposure. Attempts were made to determine what constituents of the bile produced this highly selective bactericidal action. By fractioning the bile, it was found that the bactericidal substance of rabbit bile for certain strains of streptococci was alcohol soluble but precipitated by ether. It is either present with or identical with a bile salt. The writer concludes that "rabbit bile either has some substance in its composition that is not found in other types of bile, or that its chemical construction is different, thereby giving it this peculiar property."—L. W. F.

1864. The Cause of the Parallelism between the Gram Reaction and the Gentian Violet Reaction. J. W. **Churchman.** Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 17–18.

In previous studies, Churchman has shown "that a striking parallelism exists between the Gram reaction and the gentian violet reaction. The Gram-positive organisms are killed by the stain and will not grow in agar containing it; the Gram-negative organisms survive staining and grow vigorously in the presence of the dye. To this rule there are about 10 per cent of exceptions." The question arises whether the two reactions have fundamentally the same explanation. Does the fixing ability and retention of the dye by the Gram-positive organisms occur in the media containing it and lead to their death, or to inhibition of growth? A solution of the question was undertaken by attempting to grow *B. subtilis*, a Gram-positive organism, on agar containing gentian violet in minimal dilutions (1:1,000,000) and gradually working up to those of greater strengths. If the organism so trained ceased to retain the stain by Gram's method the problem would be solved. It was found impossible to train *B. subtilis* to grow in the presence of the dye; therefore the attempt was unsuccessful. Further studies were made with *B. coli*, a Gram-negative organism, which is also gentian-negative. These studies partially solved the problem. On divided gentian violet plates, surface streak seedings from a thick suspension of the organism showed equally heavy growth on the two sides—there was apparently no inhibition of growth by the dye. If increasingly weak dilutions of the organism were used in streaking, the number of colonies developing on the gentian violet side of the plate rapidly diminished, and soon disappeared. Experiments with *B. typhosus* and *B. prodigiosus*, Gram-negative organisms, gave the same results. This would indicate that only a small proportion of individuals, in a thick suspension of Gram-negative organisms are gentian-negative. The gentian-positive individuals, isolated in pure culture, proved to be as definitely Gram-negative as the gentian-negative individuals. The writer concludes that "the factor which determines the reaction of an organism to the Gram process of staining is therefore not the same as the factor which determines its reaction on divided gentian violet plates, or after staining with the dye."—L. W. F.

1865. The Isolation of Gentian Positive Individuals from a Suspension of a Gentian Negative Organism (*B. coli*). J. W. Churchman. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21. **18**, 19.

If increasingly weak dilutions of *B. coli*, a Gram-negative and gentian negative organism, are stroked on the surface of divided gentian violet plates, many more colonies will develop on the plain agar than on the gentian violet agar. Frequently no colonies appear on the gentian violet side. Only a relatively small proportion of the individuals are really gentian negative. A gentian positive strain has been isolated from a suspension of a gentian negative organism (*B. coli*) by cultivating the various colonies which appear on the plain agar side of such a plate. Two types of individuals may exist within a single bacterial strain, which differ only in their reactions to gentian violet, one growing vigorously and the other not at all on media containing gentian violet. It is stated that "these types retain the differential characteristics after many transplantations."—L. W. F.

1866. Relation of the Gentian Violet Reaction to Dilution of Implanted Suspensions. J. W. Churchman. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 20.

It has been shown that when increasingly weak dilutions of suspension of *B. coli* are stroked on divided gentian violet plates, relatively few colonies develop on the gentian violet side of the plate, or none at all, with very weak dilutions. But in such a suspension only a small proportion of the organisms may be gentian negative. However, if a suspension of organisms made from a culture which has already grown in the presence of gentian violet and has proved its resistance to the dye be submitted to the above test, it will show similar results. Therefore the phenomenon cannot be explained entirely by assuming that there are two types of individuals in the same strain, but the author suggests that "it may be due to some sort of communal property which enables bacteria, instead of pursuing individual careers, to aid each other in their growth and thus to accomplish in large groups what they cannot accomplish singly."—L. W. F.

1867. The Effect of Repeated Re-inoculations of Gentian Violet Agar with Gentian Positive Organisms. J. W. Churchman. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 20–21.

If a thick suspension of *B. subtilis*, a Gram-positive and gentian-positive organism, be stroked on the surface of a divided gentian violet plate, no growth whatsoever will develop on the gentian violet side of the plate. If repeated reinoculations with thick smears of the organism on the gentian violet half of the plate are made, a moderate growth, occasionally fairly vigorous occurs. By transplantation to gentian violet agar of organisms from this growth, no development will take place, which shows that the organism has not acquired a resistance to the dye. Also the preceding growth on the reinoculated gentian violet plate was not due to insufficiency of dye, for in some of the experiments the dye was used in strengths greatly in excess (1:100,000) of the strength necessary to prevent the growth of *B. subtilis* (1:1,000,000). In explanation of these results Churchman states that "there is some reason for believing that it may be due to a property of bacteria—not hitherto recognized—of communal action."—L. W. F.

1868. The Selective Action of Gentian Violet in Relation to Chemotherapy. J. W. Churchman. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 21–22.

Previous studies have shown that selective bacteriostasis is a complex process. The workings of the process can best be studied upon divided plates. These afford a means of observing the various elements of the process when the selective property of gentian violet is being studied. On such plates it has been found that:

"(a) Thick suspension of the Gram-positive *B. subtilis* will not grow in the presence of the dye.

"(b) By repeated re-inoculations of this organism a moderate growth can be procured on the gentian violet agar.

"(c) Thick suspension of the Gram-negative *B. coli* will grow equally well on the two halves of the plate.

"(d) If very weak dilutions of suspension of the Gram-negative *B. coli* be stroked across a divided plate a few colonies appear on the plain agar, none at all on the gentian violet agar.

"(e) From a suspension of the Gram-negative *B. coli*, a gentian negative and a gentian positive strain can be cultivated.

"(f) A thick suspension of the gentian negative strain of *B. coli* will grow equally well on the plain agar and on the gentian violet agar; if a weak dilution of the suspension be used a few colonies will appear on the plain agar, none at all on the gentian violet agar.

"(g) If a thick suspension of the gentian positive strain of *B. coli* be stroked across the plate no growth whatever occurs on the gentian agar."

From these observations the author states that "no conclusion as to the probable effect of a selective therapeutic agent is justified, unless the experiments on which this conclusion is based have taken into consideration the quantities of bacteria used."—L. W. F.

1869. The Communal Activity of Bacteria. J. W. CHURCHMAN. Proc. Soc. Exper. Biol. &. Med., N. Y., 1920–21, **18**, 22–23.

It has been previously noted that *B. coli* in thick suspensions contain many individuals which are inhibited in growth by gentian violet, although this organism, like most Gram-negative organisms, in general grew readily upon this dye. A strain of *B. coli* was isolated which was entirely fast to gentian violet; no individuals were susceptible to the bacteriostatic effects of the dye. It was isolated from a single colony growing on gentian violet agar, and kept growing for a period of several weeks by frequently transplanting to gentian violet agar. Quantitative studies on the reactions between the bacteriostatic agent and bacteria could be undertaken with such a strain, which would not be complicated by individuals of variable susceptibility to the chemical agent employed. Experiments with such a culture showed that following heavy implantation of the organism the gentian violet agar produced as heavy growths as that on plain agar, indicating that apparently the dye exerted no inhibiting action. But with single cell transplantation, by the method of Barbour, no growth ever occurred on the gentian violet medium, nor does growth occur if small groups are transplanted. Churchman states that "This would indicate that bacteria do not, as is commonly supposed, act as isolated individuals; they possess the power, in numbers, of accomplishing effects which, alone, they are incapable of. The nature of this community of action it is at present impossible even to guess at."—L. W. F.

1870. Ueber die synthetischen Fähigkeiten pathogener Bakterien und ihr biologisches Verhalten unter einfachen Ernährungsbedingungen. I. Mitteilung. Die Nahrungsbedürfnisse des Paratyphus B-Bazillus; sein Wachstum und seine Eigenschaften beim Aufbau aus einfachen chemischen Verbindungen. (On the Synthetic Capacity of Pathogenic Bacteria and their Biologic Behavior in Simple Nutrients. I. Contribution. The Nutrient Requirements of the Paratyphoid B Bacillus; Its Growth and Characteristics in its Synthesis from Simple Chemical Compounds.) H. BRAUM AND C. E. CAHN-BRONNER. Centralbl. f. Bakteriol. (etc.), I. Abt., Orig., 1921, **86**, 1–16.

Paratyphoid B will grow in a medium made up of 0.5 per cent sodium chloride, 0.2 per cent potassium biphosphate and 0.6 ammonium lactate in water under aerobic conditions. All media were made slightly alkaline to litmus. Altogether 7 strains were tested. Anaerobic growth will not occur in this medium. One of the strains was passed through 100 transfers in this medium in the course of 18 months. Potassium bromide may be substituted for sodium chloride, but not potassium iodide. The influence of additions of calcium magnesium and iron was also studied. The lactate ion may be replaced by oxalate, succinate, citrate ions, but not by carbonate or formate. Similar media with ammonium sulfate and mannitol, dextrose, maltose and glucose gave abundant growth, but none with lactose and sucrose. When nitrates or nitrites are substituted for ammonia growth may appear in the first transfer or two. but not later showing that these compounds will not serve as a nitrogen source. Various amino acids were substituted for the ammonium lactate. Glycocoll, l- leucin or l- tyrosin were unsuited, while d-alanin asparagonic acid and glutaminic acid gave good growth and l-tryptophane allowed but feeble growth. In simple media the organism shows fewer flagella, lessened motility and more slender cells than in broth. The organism remains viable at least 6 weeks. There is no evidence of mutation, the immunological reactions and virulence were unchanged.—R. E. B.

1871. Zum Nachweis von Phenol in Bakterienkulturen. (Recognition of Phenol in Bacterial Cultures.) WALTHER FRIEBER. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt., Orig., 1921, **86**, 58.

The test can be used in media without distillation. It rests upon the fact that phenol reacts with p-amido-phenol in the presence of a suitable oxidizing agent as hypochlorite with the production of indophenol, a diphenylamine dye, which gives a green-blue to deep blue color to the medium. The technique is to add to 10 cc. of culture at least 2–3 days old 1 cc. of 10 per cent KOH, then 0.5 cc. of a freshly prepared 0.1 per cent solution of p-amidophenol-chlorhydrate and 2–3 drops of sodium hypochlorite solution (Liquor natrii hypochlorose 19° Be' Merck). Paraoxybenzoic acid also gives this color reaction, so it does not indicate phenol only. However, it constitutes a valuable color reaction which may be used for differentiation of bacteria.—R. E. B.

1872. The Oxidation of Sulfur by Microorganisms. S. A. WAKSMAN AND J. S. JOFFE. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 1–3.

Through the activities of certain groups of microorganisms, two groups of phenomena relative to the sulfur cycle are recognized: (1) the reduction phenomena, resulting in the production of hydrogen sulfide, and (2) the oxidation phenomena, when H_2S is oxidized to S, and the latter to H_2SO_4.

Usually the sulfur oxidizing bacteria have been divided into 4 groups, depending upon various characteristics—not all of the organisms have been isolated in pure culture. The writers suggest the addition of a fifth group of sulfur-oxidizing bacteria: organisms which they have isolated and studied in the New Jersey Agricultural Experiment Station.

By means of a purely inorganic culture medium, consisting of minerals with elementary sulfur as the only source of energy, they isolated the organisms from composts (sulfur, phosphate rock and soil). The organisms do not need any organic substance for their development, the carbon being derived from the CO_2 of the air; they are autotropic. They act only upon elementary sulfur, not upon thiosulfates and H_2S, and cause an acidity of the medium up to a pH of 0.8 to 1.2. Sulfuric acid is produced through the rapid oxidation of the sulfur, and when the medium is poor in neutralizing substances, to the extent that the growth of the organism is inhibited. These organisms produce a greater concentration of acids, and remain alive in that acid medium beyond any point ever before known in biological phenomena.—L. W. F.

1873. Beitrag zur Physiologie und Morphologie der Thionsäurebakterien (Omelianski). (Contribution to the Physiology and Morphology of Thionic Acid Bacteria (Omeliansky)). K. Trautwein. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1921, **53**, 513–548.

The thionic acid bacteria include those sulfur bacteria which are able to oxidize sulfur compounds without storing any sulfur within their cells. The author isolated a motile organism, 1-2 × 0.5 μ in size from canal water and soil, which is able to oxidize sodium thiosulfate, according to the following reaction:

$$Na_2S_2O_3 + 2O_2 + H_2O = Na_2SO_4 + H_2SO_4$$

In contradistinction to those sulfur bacteria studied by Nathanson, Beijerinck, and Jacobsen, this organism does not produce any free sulfur from the thiosulfate. The organism oxidizes also hydrogen sulfide, sulfides and elementary sulfur. It grows readily in bouillon and on agar and gelatin media, the gelatin being slowly liquefied. It derives its carbon from the CO_2 of the atmosphere, but is also able to utilize various organic carbon sources, particularly maltose, lactose, galactose, and cane sugar. The organism is therefore, facultative-autotrophic. It is aerobic and obtains its oxygen both from the reduction of nitrates and from the atmosphere. Asparagin is the best source of nitrogen, followed by nitrates and ammonium salts. The organism is non-spore-forming and is rapidly destroyed at 50–55°C. The optimum reaction for its activites is at pH 7.0 to pH 9.0, the alkaline limit being at pH 10.75, while the acid limit is about pH 3.5. With the growth of the organism at pH 5.7 to pH 7.8, the final pH is 8.2 and 8.7 respectively.

The medium used for the isolation of this organism has the following composition: Distilled water 100 gm., $MgCl_2$–0.01, KNO_3–0.1, Na_2HPO_4–0.02, $Na_2S_2O_3$ –0.2, $NaHCO_3$ – 0.01, NH_4Cl (when used in place of KNO_3) –0.01.—S. A. W.

1874. On the Supposed Life-Cycle of Bacteria. Hilding Bergstrand. Johns Hopkins Hosp. Bull., Balt., 1921, **32**, 234–237.

Bergstrand presents the existing evidence that bacteria have a life cycle and considers this a promising field for investigation.—F. W. H.

THE D'HERELLE PHENOMENON—BACTERIOPHAGE

1875. Preliminary Report on a Typhoid Bacteriophage. A. Kuttner. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 158–163.

A report is made upon the lytic principle isolated from the stool of a typhoid convalescent by the technic of d'Hérelle. After emulsifying a small particle of the feces in broth and incubating it over night, twice its volume of broth was added. The diluted culture was centrifuged to remove residue, then the supernatant fluid was passed through a Berkefeld filter to remove the bacteria, etc. The filtrate showed both inhibitory and lytic properties when added to cultures of the homologous typhoid strain. A small amount of the filtrate when added to a tube of broth would prevent the growth of the organism even after heavy inoculations. Also the addition of small amounts of the filtrate to young, turbid broth cultures dissolved the organism, causing a clearing of the opaque emulsion. The lytic principle could then be transmitted in series from both the inhibited and the dissolved cultures. The lytic action was found to be non-specific since it acted upon the Shiga and Mt. Desert dysentery cultures, but it was not found to act upon strains of paratyphoid A, paratyphoid B, *B. coli communis*, *B. coli communior*, nor does it appear to dissolve or inhibit growth of Gram-positive organisms such as the pneumococcus. Young actively growing typhoid cultures are essential for the activity of the lytic principle. But it does not persist, and cannot be transmitted in Berkefeld filtrate of such cultures which contain a certain amount of bacterial protein in solution. Cultures killed by heat or by ether are not dissolved, nor is the lytic principle transmitted from these. In sterile broth, the lytic principle does not maintain its activity for any length of time, nor can it be transmitted in series in this medium. After an exposure of 30 minutes at 75°C., it loses its activity but is not destroyed in 30 minutes at 70°C. The dissolved or inhibited cultures usually do not become absolutely sterile, since subcultures made from either show a small number of discrete colonies, usually at the margin of the slant. Usually two types of colonies develop: one the round, typical typhoid colony, the other jagged. Fishings to broth of the round colony develop a cloudy growth, while those from the irregular colonies often remain clear after 12 to 18 hours in the incubator. It was found that the lytic principle can be transmitted in series from the broth fishings of the irregular colony in the same way as from the original stool filtrate. The irregular colony type appears to be the bearer of the lytic principle. Stock cultures of the organism used in these experiments, when streaked out, failed to show a similar irregular type of colony. But streaks from irregular colonies showed a certain number of typical round colonies which develop a turbid growth when fished on broth. Streaks from the typical round colonies on restreaking only develop like type. If a series of lytic colonies, developing in a row, are examined under the microscope often minute transparent masses are found between the colonies. These have been called "appearances" and the lytic colonies owe their irregular shape to the fact that their edges have faded out into these transparent "appearances." Fishings made from these "appearances" to various media usually failed to develop any growth. When growth did occur, the colonies were of the lytic type. Nothing was found to indicate that "appearances" represent living cultures; various staining methods failed to reveal a definite structure. It is suggested that when a fluid culture is rendered transparent by the lytic principle, the susceptible bacilli present are reduced to the state of "appearances."

The potency of this lytic principle has not been found to increase from generation to generation, but has remained the same over a period of 3 months. Tests have shown that the amount of bacterial protein dissolved does not seem to influence, to any extent, the activity of the lytic principle. In a dilution of 1:10, the lytic principle dissolves a turbid culture in from 2 to 4 hours, while a dilution of 1:100 usually dissolves the culture in 12 hours. Cultures usually contain some resistant bacilli; these generally overcome the lytic action and in transparent cultures finally develop to the extent that the culture becomes cloudy again. Although cultures made from these resistant types may retard the lytic action of the lytic principle, cultures from them are dissolved or become transparent.

It was found that the lytic principle acts more rapidly at a temperature of 41 to 42°C., but between 45 and 50°C. the lytic principle is inactive. These lytic principles are only active when added to young growing cultures. The best results in lysis experiments were with an emulsion made by washing off the growth from a young agar culture with broth, then adding sufficient of this suspension to 10 cc. of sterile broth to make it definitely cloudy. Another important fact is that one single contact with the lytic principle is sufficient to divide a normal culture into two types—one the typical colony, the other atypical carrying the lytic property. In some instances the two types may be obtained by adding the lytic principle in a dilution of 1:10 to a turbid culture, shaking the mixture, then plating immediately. Or by adding a drop of an active filtrate on a young agar growth of typhoid, the culture will be dissolved at the point of contact. If the plate is incubated another day, a few lytic colonies may develop in the area originally cleared by the drop of lytic principle. In the original cultures, the so-called "resistant bacilli" must be present together with the "susceptible bacilli."—L. W. F.

1876. Studies on the Lytic Agent of Bordet and Ciuca. A. GRATIA. Proc. Soc. Exper. Biol. & Med., N. Y., 1920-21, 18, 192-193.

Gratia procured from Bordet a strain of *B. coli* which the latter had used in his studies, also a quantity of the corresponding lytic agent, and a typical mucoid strain of his modified *B. coli*. With this material the writer carried out his studies, and observed the following facts:

"1. The inhibition produced by the lytic principle on the growth of *B. coli* is greatly influenced by the reaction of the medium: faint in a slightly acid (pH 6.8) or neutral (pH 7.0) or even slightly alkaline broth (pH 7.4), it is much stronger in a more alkaline medium (pH 8.0 or 8.5).

"2. We have isolated from the original strain of *B. coli* two types of organisms: the one, Type S, is sensitive to the lytic agent; the other, Type R, (S = sensitive; R = resistant) is much more resistant. These types are distinguished also by other characteristics: Type S grows quickly in artificial medium and is non-motile; Type R grows more slowly, is extremely motile, much less phagocytable and more virulent. Both types ferment carbohydrates, saccharose excepted; Type R decolorizes neutral red, Type S does not. Both types keep their individuality even after passage through a guinea pig.

"3. The original lytic agent was found to be specific; it acted exclusively on the coli with which the guinea pigs had been injected. By allowing this original lytic principle to act on broth cultures of our two types of *B. coli* we have obtained two new filtrates. The, first, resulting from dissolution of the sensitive strain S, is specific as is the original filtrate. But with the second, obtained from the resistant strain R, Doctor Wollstein of the Rockefeller Institute has found a marked action on Shiga, on Flexner and on Hiss dysentery bacilli. In consequence of this observation we have been able, by a method of successive passages through appropriate strains, to extend the lytic power to other species, as typhoid and paratyphoid bacilli, and have obtained by this somewhat different technique results similar to those recently published by Bordet and Ciuca (Compt. rend. Soc. belge biol., 1921, 84, 278).

"4. We have observed also that the modified *coli* of Bordet and Ciuca, e.g., the *coli* which has resisted the lytic action, contains two types of organisms: a mucoid and fluorescent type, *coli* M 1, and a non-mucoid and translucent type, *coli* M 2. Both types, once isolated, keep their individuality after many passages in artificial media, but if the non-mucoid *coli* M 2 is submitted again to the lytic agent, we find amongst the organisms which resist a certain number of mucoid bacilli."—L. W. F.

1877. Preliminary Report on a Staphylococcus Bacteriophage. A. GRATIA. Proc. Soc. Exper. Biol. & Med., N. Y., 1920-21, 18, 217-219.

Twort, in 1915, observed a certain number of micrococcus colonies developing from streaks of glycerinated calf vaccinia on agar streaks, which appeared glassy, transparent, and degenerated with a granular material. These colonies could not be subcultured, but when diluted 1,000,000 times, filtered, and added to a normal culture of the micrococci, gave rise to the same degeneration. This observation antedated the discovery of d'Herelle by 2 years; the writer, because of the similarity existing between Twort's observation and the d'Herelle phenomenon, studied vaccinia with the hope that he might find a typical bacteriophage for staphylococci. Untreated fresh green vaccinia pulp was seeded upon several agar slants, upon which developed *Staphylococcus albus*, *Staphylococcus aureus*, and *B. coli*. The growth appeared normal in all tubes but one, in which a few small, clarified areas were found. When filtrates obtained from subcultures of these clarified spots were added to staphylococci, they were found to possess a marked inhibiting and dissolving action on the growth. This lysis could be carried on indefinitely from one culture to another. The staphylococcus is the first Gram-positive organism for which an observation of transmissible autolysis has been made. So far attempts to extend the lysis to other cocci have been unsuccessful. Great variations in sensitiveness exist among different strains of staphylococcus; certain ones remain unaffected; even a variation exists between different individuals of a single strain—an observation which has been made on other species. Streaks on agar plates made from the partially dissolved culture of staphylococcus give a poor growth of glassy irregular colonies in the first streak (heavy), but in the subsequent streaks the colonies become less irregular, and finally become normally round and opaque. Transplants from round colonies only give round colonies, while those from the irregular colonies give irregular colonies in the first streaks, and in subsequent streaks, less irregular colonies, until finally they give the round forms. Sterile filtrates from the dissolved cultures of these staphylococci exerted a coagulant effect on all kinds of non-spontaneously-coagulable blood plasma (oxalated, citrated, salted, hirudinized, filtered plasma, etc.).—L. W. F.

1878. On the Influence of Tissue Enzymes on the Bacteriophage Principle. A. G. Kuttner. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, 18, 222–225.

Previous investigations by the writer on the d'Herelle pheomenon suggested that the lytic agent might be derived from the bacterial cell itself. In the present study, an attempt has been made to produce a lytic principle from the typhoid bacillus without any interaction with the living animal body. An early theory suggested by d'Herelle that the phenomenon might be due either to an activation of the natural autolysin present in all bacteria, or to the removal of autolysin-inhibiting substance. If this natural autolysin was once liberated, it could in turn liberate an active autolysin from the next generation of bacteria, and so on indefinitely. The results of the work of other investigators suggested that tissue extracts might play a part in starting the activities of the autolysin. Therefore, investigation has been directed along that line. Extracts have been made from two different tissues derived from guinea pigs, which, when added to typhoid bacilli, cause lysis, and is capable of transmission in series. One was a glycerin extract of the small intestine, the other, a liver extract prepared according to the method used by Turro in preparing tissue extracts. Details are given for the preparation of each of the extracts used in these studies. The action of these tissue extracts does not appear to be specific, although their range has not been determined. Both the intestinal and the liver extracts are active against several different strains of typhoid, therefore the results are not due to the idiosyncrasies of one strain. Platings of the normal culture fail to reveal any irregular colonies carrying the lytic principle. No lytic principle has been isolated with the interaction of tissue enzymes with the typhoid bacilli.—L. W. F.

PHYSICAL CHEMISTRY

(*See also Number 2030*)

1879. Colorimetric Determination of Hydogen Ion Concentration by Means of a Double-wedge Comparator. G. D. Barnett and C. W. Barnett. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, 18,, 127–131.

A method for determining hydrogen ion concentration colorimetrically, using phenolsulphonephthalein as indicator, but without the use of buffer solutions, was previously reported by one of the above workers. In that method the indicator was divided between two tubes, one containing 5 cc. of a weak acid, the other the same amount of weak base. An improved method has since been developed, in which the two tubes have been discarded; instead a new comparator is used. The comparator consists of "a long narrow rectangular glass box containing a diagonal glass partition dividing it into two equal wedge-shaped compartments placed base to apex". The writers made their comparator in the laboratory from the glass of discarded x-ray plates jointed by balsam according to the following dimensions: Inside length, 35 cm.; fluid diameter, 15 mm.; height 2.5 cm. No leakage difficulties were experienced owing to the use of extremely weak acid and base. After using each day, the boxes were carefully dried with filter paper. For use, one wedge of the box is filled with acid indicator solution and the other with alkaline indicator solution of the same concentration. A complete range of color change of the indicator is produced by light transmitted horizontally through the box. The color scale in terms of pH was calibrated by placing buffer solutions of known hydrogen ion concentration and containing the same indicator concentration in a small glass box having the same fluid diameter as the large box. An exact color match is thus obtained for any given buffer solution within the range of the indicator. A scale, divided into 100 parts graduated from left to right, is placed along the lower edge of the comparator so that "if the acid color of the indicator occupies the left end of the comparator, the readings of the scale will thus represent the percentage of alkaline indicator color present in the color blend observed at the point." It was found that the colors were best viewed against an oblique plate mirror reflecting the sky. They used the following buffer solutions, the phthalate, phosphate, and borate mixtures of Clark and Lubs. The pH values were checked with the hydrogen electrode by the method of Clark, and the tables of Schmidt and Hoagland were used. They give tables showing the "dissociation constants" (calculated mid-point pH, that is, the pH value at which the indicator is half transformed from acid to salt form), at 20°C. for a number of indicators based upon their observations. Also they give a table showing the scale value of the pH at convenient intervals. They state that "with reasonable care the error of such a reading is certainly not greater than 0.02 pH especially in the region of the mid-point, where the indicators are most used," also that "compensation for colored or turbid solutions is made by placing a small glass compartment of the same fluid diameter behind that portion of the comparator in which the match is to be obtained."—L. W. F.

1880. Hydrogen Ions, Titration and the Buffer Index of Bacteriological Media. J. H. Brown. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18,** 285–286.

Brown considers the buffer content of bacteriological media quite as important as the hydrogen ion concentration. In support of this view he cites the work of other investigators. By titration against a standard acid or alkali solution, the buffer content of media may be determined between stated limits of hydrogen ion concentration. The term "reserve acidity" is used to indicate the amount of alkali required to reduce the hydrogen ion concentration of a medium from its initial reaction to a stated lower hydrogen ion concentration. If a medium has its hydrogen ion concentration reduced from its initial to a lower level, for example, pH 8.0, the "reserve acidity" of the medium may be indicated by the symbols RH (pH n–8) in which n = the initial pH. The "reserve alkalinity" is that amount of acid required to raise the hydrogen ion concentration from pH n to higher level, for example, pH 5.0, where the symbols ROH (pH n – 5) represent the reaction. The "buffer index" is the sum of the "reserve acidity" plus the "reserve alkalinity," and indicated by the symbols BI (pH 8 – 5) in the examples quoted. The values of each can be expressed in terms of per cent of normal acid or alkali, that is, the number of cc. of N/1 acid or alkali required to change the hydrogen ion concentration of 100 cc. of medium from one stated hydrogen ion concentration to the other. The range of hydrogen ion concentration between the limits of pH 8.0 and 5.0 is sufficient for most purposes, although the "buffer index" may be determined between other limits for special purposes. The writer found wide variations in the buffer indices in a large number of bouillon samples of supposedly the same composition. He calls attention to the "buffer index" requirements of media to be used for particular purposes in bacteriological studies.—L. W. F.

BACTERIOLOGICAL TECHNIC

1881. A Method for Obtaining Stable Suspensions of Streptococci for Agglutination. John F. Norton. J. Am. M. Ass., Chicago, 1921, **76,** 1753.

The organisms are grown in veal infusion broth (1 per cent bacteriologic peptone, 0.5 per cent salt) of reaction pH 7.6 to which is added before sterilization 2 per cent dextrin. Before incubation 3 drops of ascitic fluid water (1:3) are added aseptically to each tube. The broth tubes are inoculated from a 24-hour blood agar tube. After 18 to 24 hours' incubation the culture is filtered through cotton. For diluting the cultures dextrin broth is used. Reading is made after one and one-half hours' incubation. No difference in reading was observed after the tubes had been placed in an ice chest over night.—P. G. H.

1882. Impure and Misnamed Stock Cultures of Obligate Anaerobes. I. C. Hall. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18,** 314–316.

Hall calls attention to the fact that exceptional care is necessary to avoid contamination and subsequent loss of identity in stock cultures of obligative anaerobic bacteria—no culture can be accepted upon its face value. In his own laboratory, where anaerobic bacteriology has been especially studied, he observed, in a few instances, contaminations which completely supplanted the pure cultures of the original anaerobes. The most probable source of anaerobic contamination is imperfectly sterilized culture medium. *B. sporogenes* was found to be the most common organism contaminating the stock cultures. These observations are supported by investigations which he reports upon cultures received from other laboratories, most of which were already labeled as to species. The paper also directs attention to methods of purification of such contaminated cultures.—L. W. F.

1883. Factors Influencing Anaërobiosis with Special Reference to the Use of Fresh Tissue. F. L. Gates and P. K. Olitsky. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18,** 93.

In a study of certain elements influencing either favorably or unfavorably the development of anaërobic conditions in tissue cultures, the writers used methylene blue as an indicator. It was found that liquid paraffin oil has very little value in inhibiting the access of oxygen when used as a seal in gas analysis or for anaërobic cultures, but solid vaseline forms an effective oxygen-resisting seal. The physical states of the substances at incubator temperature are the important factors controlling the results. Fresh kidney tissue quickly decolorizes methylene blue in its vicinity. It is an active reducing agent whose effect is relative to the amount used. At least 0.6 gm. is required to produce an adequate oxygen free zone per tube. Depending on its constituents, culture media may be classified either as (1) reducing or (2) nonreducing. Those containing dextrose or peptone in a faintly alkaline solution belong in the first, while those containing ascitic fluid or dilute serum fall in the second class. The latter class required the addition of reducing substances such as dextrose, peptone, or kidney tissue to establish anaërobic conditions, which must be aided by an effective seal or anaërobic jar. Oxygen does not penetrate to the depths of the tube in semi-solid media, but these media limit the efficient action of imbedded kidney tissue. If a vaseline seal is used, the length of the column of medium is of minor importance.—L. W. F.

1884. A Method of Standardizing Bacterial Suspensions. F. L. GATES. Proc. Soc. Exper. Biol. & Med., N. Y., 1919–20, 17, 39–41.

Gates found that if a wire loop (at right angles to end) were thrust down in a measured volume of homogeneous bacterial suspension in a test tube, when viewed from above, the loop disappeared from sight at a certain depth. This depended upon the opacity produced by the concentration of organisms in suspension. If the same suspension was diluted by the addition of an equal volume of diluent used, and the test repeated, the depth at which the loop disappeared from view was less than twice that observed in the first reading. The reading was not in proportion to the dilution volume, or the bacterial concentration. This is explained as being due to a constant present in each reading which is apparently related to the size and opacity of the individual organisms. The constant could be eliminated and a *corrected* reading (the observed reading minus the constant) be made for any suspension by making two readings at different dilutions of the suspension. By eliminating the constant the opacity observations are brought into inverse ratio with the corresponding bacterial concentrations. The corrections are made by substituting the observed values in the following equation:

$$A = \frac{\text{vol } a\ (b - a)}{\text{vol } b - \text{vol } a}, \text{ in which}$$

A = the corrected reading for the first volume of the suspension = (a − constant).
a = first observed reading.
vol a = first volume of the suspension on which reading a is made.
b = second observed reading.
vol b = second volume of the suspension (diluted) on which reading b is made.

Direct comparisons may be made between different suspensions of the same organism, by means of the *corrected* readings of each, since they stand in inverse ratio to their bacterial concentration.

For actual bacterial counts, a standard must be established for the given organism by correlation of several corrected readings with the corresponding counts made in the usual way. After establishing this relation, the concentration of the organisms per cubic centimeter in suspension is obtained by inverse proportion:

$$\frac{\text{The required count}}{\text{The standard count}} = \frac{\text{The standard corrected opacity}}{\text{The given corrected opacity}}$$

The apparatus required and the technic used are given as follows;

"The simplest possible instrument for making the determinations consists of a piece of 18 gauge nichrome, chromel or black iron wire about 20 cm. long, bent into a small loop at right angles to one end, and with the other end thrust through a cork near one side, so that a view may be obtained past the cork into an ordinary test tube 1.6 × 16 cm. on whose lip it rests. The sterile test tube is partly filled with a measured quantity of the suspension, and the wire loop raised or lowered through the cork until the point is found at which the loop just disappears from view. The distance of the loop below the meniscus is then measured with a centimeter scale laid along the tube, giving the first reading. A second reading is obtained after the addition of a measured amount of the diluent, and the data required for substitution in the equation for the corrected reading is at hand."

The method requires only 2 or 3 minutes for readings and calculations. The error has been found to be less than 10 per cent. The most favorable opacity for correct readings is one of such density that the loop disappears from sight at a depth between 1 and 4 cm. The danger of contamination during the readings is reduced to a minimum by flaming the wire loop, and the portion which comes in contact with the bacterial suspension.—L. W. F.

1885. Détermination néphélométrique des émulsions bacteriénnes. (*Nephelometric Determination of Bacterial Suspensions.*) HANS HECKSCHER. Compt. rend. Soc. de biol., Par., 1921, 85, 378–381.

The construction of apparatus and method of manipulation are presented by illustrations and detailed descriptions.—G. H. S.

1886. Novelle méthode pour la numération des Bacilles vivants contenus dans une émulsion. (*New Method for Determining the Number of Living Organisms Present in a Suspension.*) **Hans Heckscher.** Proc. rend. Soc. de biol., Par., 1921, **85**, 612–613.

The method depends upon the fact that when a culture is inoculated no actual multiplication takes place within the first few hours, there is simply the increase in size of the individual organisms introduced. Thus, viable organisms can be detected by making two counts and deducting the number of organisms showing no morphologic change after incubation from the total number observed immediately after inoculation.—G. H. S.

1887. Preparation of Collodion Sacs for Use in Bacteriology. **F. L. Gates.** Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 92.

Gates discusses the preparation of colloidion sacs suitable for intraperitoneal incubation, and other bacteriological requirements. The procedure is based upon the method of Prudden and McCrae (1900) as modified by Harris (1902). The collodion sacs are made on a gelatin capsule foundation, which is then dissolved out with hot water. The collodion membranes are treated with alcohol as recommended by Brown (1915) and are protected in individual glass containers before and after use. It was found that the permeability to sodium chloride was lost through heat sterilization if the membrane had previously been allowed to dry. The properly prepared sacs were permeable to gases in solution, to inorganic salts, to dextrose, to certain protein-split products (nutritive to bacteria), and to certain toxic products of bacterial metabolism. Antibodies, unsplit proteins, bacteria and body cells, fail to pass. The writer's report does not give details of the preparation of the sac; he reserves this for a later publication elsewhere.—L. W. F.

1888. Subcutaneous Tubes for Chemotactic Studies and Leucocyte Collection. **F. L. Gates**· Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 280–281.

Gates describes a procedure by which studies of the chemotactic influences of various substances, bacteria and their products, or the collection of phagocytes or other wandering cells, may be made in small glass test tubes embedded in the loose subcutaneous tissue of the rabbit. Fine bolting silk is tied over the mouths of test tubes 1.2 by 5 cm. forming a drum head which permits free passage of fluids and the migration of bacteria or other cells. The material or organism to be studied is added to the sterilized tubes through a hollow needle. Under anesthesia, make a single dorsal incision under aseptic precautions, do a blunt dissection of the loose subcutaneous tissue, then place a tube in each flank. Close the incision under aseptic surgical means. The tube contents may be removed after carefully cleansing the skin with iodine and alcohol, then plunging the needles of two 20 cc. syringes through the cloth. One syringe is already filled with a replacement fluid such as Ringer's solution, the other syringe is empty. As the tube contents are drawn out into the empty syringe, the replacement fluid is forced in from the other syringe. In this way the tube is washed out and refilled with fresh material. The embedded tube causes no irritation, and may be left in place for weeks or months. The contents may be withdrawn as desired. A small amount of aleuronat in agar in such a tube which is filled up with Ringer's solution affords a daily supply of leucocytes for phagocytic experiments over a long period. The method offers an opportunity for a variety of studies in chemotaxis and resistance to invasion.—L. W. F.

1889. The Use of Agar Slants in Detecting Fermentation. **H. J. Conn and G. J. Hucker**· N. Y. Agric. Exp. Sta., Geneva, Tech. Bull. **84**, 1921, 3–4.

This has already been abstracted from another source, see Abs. No. 89 in the present volume.—R. S. B.

1890. Contribution a l'étude de la coloration vitale au violet de méthyle. (*Vital Staining with Methyl Violet.*) **A. Botez.** Compt. rend. Soc. de biol., Par., 1921, **85**, 583–584.

Methyl violet added to suspensions of many organisms effects vital staining. With *B. typhosus*, and the paratyphoids, *V. cholerae*, and *B. tuberculosis* terminal chromatic corpuscles appear after such staining. With *B. anthracis* chromatic masses appear both at the ends and throughout the middle portion. Pseudodiphtheria organisms and *B. dysenteriae* and *B. coli* show a well defined stained contour without staining of the central protoplasm. When the staining reaction is conducted at incubator temperature and in bouillon *B. coli* and pseudodiphtheria bacilli reduce the methyl violet; *B. diphtheriae*, *B. dysenteriae*, *B. anthracics* and *V. cholerae* do not. Methyl violet is able to lyse certain types of bacteria, and during the process aberrant forms are often found.—G. H. S.

1891. Two Stains Used in Preference to Wright's Stain in the Routine Staining of Blood Smears. **G. B. Grant and E. R. Wilson.** J. Lab. & Clin. M., St. Louis, 1921, **6**, 593.

The first of these consists of 2 solutions:

I. Saturated solution of eosin in methyl alcohol.
II. Mallory's instantaneous hematoxylin.

The smear is stained with Solution No. 1, 2 to 2½ minutes, washed with distilled water, stained with Solution No. 2, 3 to 4 minutes, again washed with distilled water, blotted and dried.

Though this is satisfactory for differential counts it is unsatisfactory for staining malaria parasites, for which purpose the authors substitute a 0.25 per cent aqueous solution of azure II in place of the hematoxylin solution, staining with the azure II for 20 to 40 seconds.—F. W. H.

1892. Weitere Erfahrungen über Spirochätenfärbungen im Nervengewebe. (*Spirochetal Staining in Nervous Tissue.*) F. Jahnel. München. med. Wchnschr., 1920, **67**, 1263.
The success of the Noguchi and Levaditi methods for staining spirochetes in brain tissue seems to depend upon some undiscovered quality of the formalin used for fixation.—B. C.

1893. Ueber Fluoreszenzfärbung von Spirochäten im vital gefärbeln· Dunkelfeldappara. (*Fluorescent Staining of Spirochetes in the Vitally Stained Dark-Field Preparation.*) F.W. Oelze. München. med. Wchnschr., 1920, **67**, 1354.
If a drop of exudate from a syphilitic lesion be added to a drop of saturated aqueous china blue solution, and the mixture examined in the dark field, it will be observed that some of the normally motile spirochetes are colored red while others remain unstained. This shows that the organism is stainable only during a certain period in its existence. The dark field pictures obtained with acid china blue combined with cyanosin are due partially to fluorescence, and are particularly striking.—B. C.

1894. Coloration vitale du Bacille de Löffler par le violet de méthyle. (*Vital Staining of Bact. diphtheriae by Methyl Violet.*) A. Botez. Compt. rend. Soc. de biol., Par., 1921, **85**, 568.
The bacterial suspension in saline is mixed with dilute methyl violet 5B. The sedimented organisms are spread upon the slide and examined. Metachromatic staining is clear and constant.—G. H. S.

1895. Rose Bengal as a General Bacterial Stain. H. J. Conn. N. Y. Agric. Exp. Sta. Geneva, Tech. Bull. 84, 1921, 5–6.
This has already been abstracted from another source, see Abs. No. 595 in the present volume.—R. S. B.

MYCOLOGY

(*See also Numbers 1924, 2003*)

1896. Sur une nouvelle espèce de levure du genre Debaryomyces (*D. matruchoti*). (*New Species of Yeast of the Genus Debaryomyces* (*D. matruchoti*).) Grigoraki and Peju. Compt. rend. Soc. de biol., Par., 1921, **85**, 459–462.
The new species here described in detail was isolated from the stools of a patient suffering from helminthiasis.—G. H. S.

SOIL BACTERIOLOGY

1897. Bacillus amylobacter A. Meyer et Bredemann und seine Beziehung zu den Kolloiden. (*Bacillus amylobacter A. Meyer et Brademann and its Relation to Colloids.*) Kurt Lantzsch. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1921, **54**, 1–12.
By adding to a nutrient solution a colloid, like soil extract, animal charcoal, gelatin, etc., the period of germination of the spores of *B. amylobacter* is rapidly decreased; the period of incubation, from inoculation to beginning of fermentation, was reduced from 51 days, in a nutrient solution free from colloids, to 3 days, in the presence of 0.25–1.0 per cent gelatin. In the presence of a colloid, a clear zone (like a corona around the sun) is found to surround the spores; this was not present in the spore suspension to which no colloid has been added. The lowering of the length of time necessary for the germination of *B. amylobacter* spores can, therefore, be explained by adsorption phenomena. The author points out, however, that this may be a result of more complex phenomena due to the very nature of complicated soil conditions.—S. A. W.

PLANT PATHOLOGY

1898. The Behavior of Crown Gall on the Rubber Tree (*Ficus elastica*). M. Levine. Proc. Soc. Exper. Biol. & Med., N. Y., 1919–20, **17**, 157–158.
In a review of previous studies on crown gall, produced by *Bacterium tumefaciens*, the author discusses a certain resemblance between this neoplasm in plants and animal cancer. Many factors must be considered as influencing the development of crown gall, which complicate the study. The common rubber plant offers a special advantage as a host plant, in such investigations, as its growth and environment are subject to better control than certain other annuals, biennials, or deciduous trees used in past studies. Inoculations of *Bacterium tumefaciens* made into the apical internode of the branches, into the leaves or main stem of the rubber tree, caused the development of benign or malignant neoplasms in the region inoculated. Death of the stem, both upward and downward from the gall, occurred, possibly caused by the products of the disintegrating crown gall, or from products of the crown gall organism being carried into the circulation of the stem. In this respect Levine recognizes a certain similarity between the crown gall of the plant, and malignant growths in animal cancer.—L. W. F.

DAIRY BACTERIOLOGY

(*See also Number 1904*)

1899. The Relation of Acidity to the Coagulation Temperature of Evaporated Milk. L. A. Rogers, E. F. Deysher and F. R. Evans. J. Dairy Sc., Balt., 1921, 4, 294–309.

This paper is of interest to dairy bacteriologists because of its discussion of the grading of milk on the basis of acidity, the conclusions reached being as follows:

"In the light of the results obtained in this investigation, we are unable to conclude that under commerical conditions there is any very definite relation between the acid-base ratio of raw milk and the coagulating point of the evaporated milk.

"Notwithstanding the generally accepted views as to the value of grading milk on the basis of titratable acidity, the results obtained by determining the hydrogen-ion concentration electrometrically do not indicate that the relation between the acidity of fresh milk and the coagulating point after it is evaporated is sufficiently uniform to make it of much value in grading milk."—R. S. B.

1900. A Study of Brown Glass Milk Bottles. B. W. Hammer and W. A. Cordes. Iowa Agric. Exp. Sta., Ames, Research Bull. 64, 1920, 99–111.

Brown glass milk bottles have occasionally been used commercially for the delivery of butter milk, primarily to eliminate the error of delivering buttermilk for sweet milk. The objection to such bottles for general use in the milk trade has been that their color prevents inspection of the product contained in them. The authors point out, however, that their use involves other considerations as well. After study they conclude that the flavor and color of milk are quickly affected by sunlight where milk is exposed in clear glass bottles while these effects are not produced in the brown glass bottles. The flavor most frequently noted was a tallowy flavor, and this was produced in the milk in the clear glass bottles under conditions that indicated that it was not connected with any bacteial growth. The dark colored bottles absorbed heat so that milk exposed in them was several degrees warmer than milk exposed under similar conditions in clear glass bottles. The bacterial count of the milk in the brown glass bottles was greater than that of milk in clear glass bottles; this difference was primarily correlated with the warmer temperature of the milk in the brown bottles, but the data also indicated that the count of the milk in the clear glass bottles was reduced by the direct action of the sunlight. The chief practical conclusion drawn from these observations was that there was real reason for protecting milk from the action of direct sunlight, undesirable flavors being rapidly produced under such conditions even though the milk was held at a low temperature.—R. S. B.

1901. New Angles to the Starter Maker's Problem. B. W. Hammer. J. Dairy Sc. Balt., 1921, 4, 277–285.

This is an account of the work done at the Iowa Agr. Exp. Sta. on the nature of the organisms present in good butter starters. Evidence is given that these contain an organism, *Streptococcus citrovorus* Hammer, in addition to the ordinary *S. lacticus*. Determinations of volatile acidity of starters containing *S. lacticus* alone show much lower amounts than are found in starters made of a mixture of the two organisms. The starters containing the lactic acid organism only were found to be decidedly lacking in aroma and flavor while those made from the mixtures had aromas essentially like those of a good starter. Likewise, because *S. lacticus* develops dextro-lactic acid only, while starters were found to contain inactive lactic acid as well, the author feels that good starters are composed of more than the one organism. *S. citrovorus* grows well in mixed culture with *S. lacticus* and tends to inhibit its growth somewhat. The author points out that, while the necessity for growing mixed cultures in order to secure good starters complicates matters, yet definite knowledge that this is the case makes it possible to do this with a better understanding of the problem involved.—R. S. B.

1902. The Relation of the Number of Bacteria in Milk to the Quality and Yield of Cheese. G. J. Hucker. N. Y. Agr. Exp. Sta. (Geneva), 1921, Bull. 486, 19 pp.

The author studied the quality of the milk used in cheese making at a commercial cheese factory during the summer of 1920 from the standpoint of the number of bacteria present. Counts were made by direct microscopic examination of the patrons' milk and of the mixed milk at the time of setting the curd. No definite relation was found to exist between the number of bacteria in the milk used and the quality or yield of cheese at this factory. The milk containing the fewest bacteria produced both the best and the poorest cheeses, while milk containing the highest numbers of any received at this factory (from 12 to 42 millions per cc. as determined microscopically) produced cheese of more constant and fairly good quality.

It is concluded that the present method of grading market milk on the basis of the number of bacteria present is not suited for use at cheese factories, where the type of bacteria present in the milk is of greater importance than their number.—R. S. B.

COMPARATIVE PATHOLOGY

(*See also Numbers 1936, 1990, 2058*)

1903. Studies in Infectious Abortion. I. On the presence of Bacterium abortus in the Deeper Layers of the Mucous Membrane of the Non-gravid Uterus. II. A Few Notes on the Isolation and Cultivation of Bacterium abortus with special Reference to Liver and Spleen Media. III. On the Possibility of Differentiating between Infected and Immune Animals in Infectious Abortion. H. J. STAFSETH. Mich. Agr. Exp. Sta. (East Lansing), 1920, Tech. Bull. 49, 1–24.

The author reports evidence in his first article that supports the view that *Bact. abortum* does not persist indefinitely in the gential tract and does not penetrate into the deeper layers of the mucous membrane and remain there as a latent infection. In his second article he reports that liver and spleen media have been found the most useful in isolating this organism. The use of *Bacillus subtilis* cultures as a means of producing anaerobiosis was found to be unnecessary as the abortion organism grew satisfactorily in glass jars from which the air had been partially withdrawn. In the third article, the author reports that the intradermal abortion test is a reliable and specific test for *Bact. abortum* infection in guinea pigs, and concludes that it may be found useful in detecting infectious abortion in cattle.—R. S. B.

1904. Studies in Infectious Abortion. IV. The Isolation of Bacterium abortus from Milk. I. FOREST HUDDLESON. Mich. Agr. Exp. Sta. (East Lansing), 1920, Tech. Bull. 49, 25–30.

Liver infusion agar prepared without excessive heating and filtered through glass wool is reported to be the best medium for this purpose. It is necessary to secure the correct H-ion concentration of 6.6 to 6.4 for optimum growth. Inoculated media are grown in closed chambers in which 10 per cent of the air is displaced by CO_2. A large part of the organisms occurring in milk, other than *Bact. abortum* are eliminated by adding enough gentian violet to the agar to produce a 1 to 10,000 dilution. Results obtained with this isolation method are found to agree with those secured by the guinea pig inoculation method. The advantage of the planting method over the inoculation method lies in the fact that results are secured in 4 days whereas the inoculation method requires at least 8 weeks.—R. S. B.

1905. Sulla siero-diagnosi del morbo coitale maligno. (*The Serum Diagnosis of Dourine.*) G. MARCONE AND F. DEGASPERI. Clin. vet., Milano, 1921, **44**, 257–263.

As a continuation of their work with biological tests for dourine already noted in a previous number of the same journal, the authors here discuss the results obtained with the precipitation test, fixation of complement and the flocculation test of Sachs and Georgi.

The technique used for the precipitation test was that of Winkler and Wyschelessky. Nagana trypanosomes, obtained by the method described in the previous article in connection with the Lange test, were washed carefully and properly diluted, and an extract prepared by agitation with glass beads. After centrifugation, this extract was filtered through a Berkefeld filter. The test was performed in Uhlenhuth tubes; the sera, as such or diluted with salt solution in the proportions of 1–5 or 1–10, being added by means of a Pasteur pipette so as to underlie the trypanosome extract. The serum of sick horses, fresh or kept only a few days, when it comes in contact with the extract gives rise to the formation of a distinct cloudiness at the junction point of the two liquids.

For complement fixation they prepared the antigen according to the directions of Winkler and Wyschelessky. Fresh guinea pig serum was used as complement. Inactivation of sera was accomplished by heating at 52°C. for half an hour, or at 55°C. in some instances. Heating at 52°C. was stated to give rather better results than heating at 55°C.

For the flocculation reaction of Sachs and Georgi, they used as antigen an alcoholic extract of the heart of a horse, cholesterinized. This extract was diluted with salt solution in the manner suggested by Sachs and Rondoni for similar antigen in the Wassermann test.

The optimum titer of the extract was determined by previous test, acting against known sera with complement in a hemolytic system, with a 5 per cent suspension of sheep corpuscles, and with salt solution alone. The actual tests were held for 2 hours at 37°, 18 hours at room temperature and finally 24 hours at 37°. The tests were negative with the sera of animals known to be affected with dourine, a result which the authors attribute to lack of specificity of the antigen they used.

Their general conclusions are; first, that macroscopic agglutination of the trypanosomes, precipitation and fixation of complement, as used by them with the sera of horses affected with dourine and with nagana trypanosomes, are group reactions, and second, that these same tests are the most useful means of diagnosis for dourine.—F. W. T.

1906. Untersuchungen über die "Fohlenlähme". (*Studies on Pyo-Septicemia Neonatorum.*) VALD ADSERSEN. Monatsh. f. prakt. Tierh., 1920, 31, 502–545.

Out of 114 colts, affected with navel ill, in 54 the infection was due to streptococcus pyemia; in 29 to bacillary pyo-septicemia. In streptococcus pyemia, there are abscesses in the umbilical region the infection spreading to various organs, especially the joints. The streptococci are similar to, if not identical with, those causing strangles and contagious pleuropneumonia of horses. *Bacterium viscosum equi* is the etiological agent in the cases of pyo-septicemia. Infection takes place through the umbilicus after it is severed, and not before. It is improbable that the mare harbors the organisms and is immune to them. Intrauterine infection has not been proved. General cleanliness prevents the disease; i. e., disinfection of the umbilical stump, external genitalia of the mare, etc.—W. N. B.

1907. Sur le parasite de la péribronchite nodulaire du cheval. (*The Parasite of Equine Nodular Peribronchitis.*) CH. PÉRARD AND J. DESCAZEAUX. Compt. rend. Soc. de biol., Par., 1921, **85**, 411–413.

Nematode larva, possibly *Habronema megastoma,* have been found within the nodules of the peribronchitis of horses.—G. H. S.

1908. Strongylidae in Horses. IX-XIII. W. YORKE AND J. W. S. MACFIE. Ann. Trop. M. & Parasitol., Liverp., 1920, **14**, 153–180.

In a series of papers are described the new species *Cylindropharynx rhodesiensis, Cylicostomum triramosum* and *Cylicostomum tridentatum.* One section is devoted to the genus *Poteriostomum,* Quiel and one to "species found in West Africa and Jamaica."—W. A. R.

1909. Distinguishing Characters of the Larval Stages of the Ox-Warbles, Hypoderma bovis and Hypoderma lineatum, with Description of a New Larval Stage. E. W. LAAKE. J. Agric. Research, Wash., 1921, **21**, 439–457.

The two species of *Hypoderma* are not only of great economic importance on account of the injuries caused by the larvae in cattle but they are of medical interest because they may also occur as parasites of man. The present paper is an important contribution to a knowledge of their morphology, pointing out characters by which they may be readily distinguished.

The two species are readily separated in the last two stages by comparison of the form and structure of the stigmal plates. In the third stage the cephalopharyngeal skeleton and mouth hooks are diagnostic.

The previously overloaded second stage of *H. lineatum,* taken from oesophagi of slaughtered cattle, is described in detail. The corresponding stage for *H. bovis* has not yet been found.

In the first instar of *H. bovis* the mouth hook is forked at its anterior end and blunt posteriorly, while in *H. lineatum* it is sharply pointed anteriorly, with a well formed tooth some distance below, and is slightly pointed posteriorly.—W. A. R.

1910. Untersuchungen über den Einfluss der Lidprobe. (Intrapalpebralmalleinisation) auf die Antikörper-bildung bei gesunden Pferden. (*Studies of the Influence of the Intrapalpebral Mallein Test on the Antibody Formation in Normal Horses.*) K. F. BELLER. Monatsh. f. prakt. Tierh., 1920, **31**, 545–562.

War experiences indicate the need of supplementing serologic tests with local tests. The intracutaneous injection of mallein stimulates antibody (agglutinin and complement fixing) formation in normal horses. By using 0.1 cc. diluted mallein (1 part to 3 volumes salt solution) for injection, the antibody formation is diminished and no interference with serologic tests takes place.—W. N. B.

1911. Le tossine del carbonchio sintomatico e l' endocardite tossica. (*The Toxins of Symptomatic Anthrax and Toxic Endocarditis.*) ETTORE RAVENNA. Clin. vet., Milano, 1921, **44**, 237–256.

I. The toxins of symptomatic anthrax. After reviewing the work of other investigators and discussing his own experiments the author comes to the following conclusions:

1. The bacillus of symptomatic anthrax produces exotoxins but does not seem to furnish endotoxins.
2. The exotoxins of symptomatic anthrax cannot be isolated with constancy and in equal potency even with uniformity in technique and other experimental conditions.
3. Cultures in Tarozzi broth furnish toxins which retain their potency even after filtration through a Berkefeld filter.
4. A period of growth of 6 to 7 days seems to be required for the formation of toxins from the culture medium.
5. The action of the toxins is most rapid and most clearly marked after intravenous and intracerebral injection of the culture filtrates.
6. Filtrates from Martin broth manifest a paralyzing action which is very remarkable and often fatal. There was observed a very rapid remission ending in complete disappearance of symptoms.
7. Filtrates which when first injected into the thorax or peritoneum seemed inactive, produced a progressive decline and death after repeated injections.
8. Guinea pigs and rabbits have been shown to be susceptible to the toxins; guinea pigs mostly by intracerebral injection. Dogs and white rats sustain with impunity large doses of active toxin.
9. The acute intoxications produce multiple hemorrhages in the viscera; more frequently and clearly in the suprarenal capsules, in the intestine and in the lungs. The chronic intoxications manifest at autopsy, a direct necrotic action by the filtrates.
10. The principal histological changes are congestion and hemorrhage, some parenchymatous degenerative processes and signs of inflammation, most evident in the lung in the form especially of leucocytic infiltration of the capillaries.

II. Experimental endocarditis caused by the toxins of symptomatic anthrax. After discussing his experiments upon animals with culture filtrates, the author concludes as follows:

Berkefeld filtrates of broth cultures of the bacillus of symptomatic anthrax when injected intravenously are capable of producing an exudative inflammation in the endocardium, myocardium and pericardium of animals susceptible to symptomatic anthrax, reproducing the histological picture of toxic endocaritis.—F. W. T.

1912. El Carbunclo en la Argentina y sa mortalidad. (*Anthrax in Argentina and its Mortality.*) Emilio E. Coni. Rev. med. vet., Buenos Aires, 1921, **6**, 3–5.

This article deals with the incidence and mortality of anthrax in Argentina and the sanitary police measures employed in combating the disease.—F. W. T.

1913. A immunizacco contra a tristeza. (*Immunization against Bovine Piroplasmosis.*) Domingos Vanzellotti. Rev. vet. Zootec., Rio de Janeiro, 1920, **10**, 93–100.

The author reports upon the successful immunization of 19 head of cattle against bovine piroplasmosis, using virulent blood containing the *Piroplasma bigeminum*. Eight animals were inoculated with 3 cc. each of virulent blood which had been "exposed to the action of a physical agent in order to attenuate the pathogenic power of the parasites." Eleven were inoculated with 3 cc. each of virulent blood and several days later, their temperature still being normal, were given 2 grams each of trypan blue by intravenous injection. The author also reports that trypan blue was used as a therapeutic agent in epidemics occurring in Brasil in 1912 and 1913, with more than 85 per cent of cures resulting.—F. W. T.

1914. Variola Humana und Maul- und Klauenseuche. Bemerkungen zu dem Artikel v. A. Groth in Nr. 52, Jahrgang 1920 der Munch. Med. Wchnschr. (*Variola Humana and Foot and Mouth Disease.*) O. Waldmann. München. tierärztl. Wchnshr., 1921, **72**, 529–531.

Because of the similarity between smallpox and foot and mouth disease, Groth and Ernst attempted to immunize cattle and hogs by intracutaneous injection of the foot and mouth disease virus. They report local aphthae at the site of injection followed in 24–48 hours by a generalized eruption. Likewise, attempts to grow the virus by injecting the contents of vesicles into the shaved skin of susceptible animals (rabbits and guinea pigs) were successful. Waldmann, who has passed foot and mouth virus through over 100 guinea pigs, criticizes Groth's technic and claims that the infections obtained by the latter were not specific, because of surface contaminations.—W. N. B.

1915. Sur l'hypothèse de l'évolution des Sarcocystis du boeuf chez un insecte hématophage, hôte définitif. (*Hypotheis of the Evolution of Bovine Sarcocystis with a Biting Insect as Definitive Host.*) Edm. Sergent. Compt. rend. Soc. de biol., Par., 1921, **85**, 408–411.

The observations are in accord with the views of Darling.—G. H. S.

1916. Osservaziani sull' afta maligna e complicanze di setticemia emorragica. (*Observations upon Malignant Aphthous Fever and Complications with Hemorrhagic Septicemia.*) Carlo Pavoni. Clin. vet., Milano, 1921, **44**, 303–309.

The author discusses an outbreak of aphthous fever of malignant type, describing one case in which the post mortem findings indicated the presence of both aphthous fever and hemorrhagic septicemia. He suggests that this malignant form of aphthous fever may be due to an association of the aphthous fever virus and the septicemia bacillus, the virus diminishing the resistance of the animal and thus favoring a secondary invasion by the bacillus.—F. W. T.

1917. L 'afta epizootica infierita nella provincia di Ferrara negli anni 1919 e 1920. (*The Aphthous Fever Epidemic Prevailing in the Province of Ferrara in the Years 1919 and 1920.*) Vincenzo Grilli. Clin. vet., Milano, 1921, **44**, 354–379.

In this article the author discusses in considerable detail the epidemic of foot and mouth disease occurring in the province of Ferrara in the years 1919 and 1920, considering causes, morbidity, clinical form, post mortem findings, treatment, preventive measures employed, etc. He also gives detailed statistics of the number of cases and the localities affected.—F. W. T.

1918. Sulla casi della rabbia spontanea del cane. (*So-called Spontaneous Rabies of the Dog.*) Pietro Cremona. Clin. vet., Milano, 1921, **44**, 298–303.

After citing the work of various investigators upon congenital rabies, the author discusses several cases of rabies which he had observed among the puppies of a setter bitch which died of rabies about 3 weeks after their birth. He then cites the work of a number of investigators showing that rabies may be transmitted by the milk of a rabid animal and comes to the conclusion that it has yet to be demonstrated that so-called spontaneous rabies is congenital and not due to infection of the young by the milk or saliva of the mother.—F. W. T.

1919. Contributo alla esiologia del cimurro del cane. (*The Etiology of Canine Distemper.*) Mario Mazzucchi. Clin. vet., Milano, 1921, **44**, 347–353.

After giving a general discussion of canine distemper and the views of various investigators regarding its etiology, the author reports the isolation of a coccobacillus, whose characteristics are described. He states that it is non-pathogenic for the animals usually employed in the laboratory, but when inoculated into dogs, produces symptoms and lesions of distemper. He further states that a polyvalent vaccine was employed in the treatment of cases with good results.—F. W. T.

1920. Aplicacion del metodo de Steinach en Zootecnia. (*Application of the Method of Steinach in Zootechnics.*) JORGE M. GROSOVICH. Rev. zootec., Buenos Aires, 1921, **8**, 183–185.

An article on the rejuvenation of the reproductive organs. Reviews some of the studies on internal secretions of Laulanie, Brown Sequard, Voronoff, Mentz von Krogh and especially the work of Steinach at Vienna, describing the results of his operations and transpantations, indicating the possibility of their application to domestic animals and even human beings.—H. M.

PARASITIC DISEASES

(*See also Numbers 1905, 1913, 1915*)

1921. (*I*) *Sur les causes du changement intervenu dans le mode de nourriture de l'Anopheles maculipennis.* (*Causes for the Change in Mode of Feeding of Anopheles maculipennis.*) C. WESENBERG-LUND. Compt. rend. Soc. de biol., Par., 1921, **85**, 383–386. (*II*) *Les Anophélinés du Danemark et les fièvres paludéennes.* (*Anophelines of Denmark and Malaria.*) Ibid., 386–387.

The absence of malaria in Denmark (not a single case of indigenous malaria has been reported in Denmark since 1900) is ascribed to changes in the habits of life and of feeding which have taken place. Although *Anopheles maculipennis* is to be found in that country it apparently has ceased to attack man.—G. H. S.

1922. Formes leishmaniennes et leptomonadiennes chez les Punaises de Chauves-Souris. (*Leishmania and Leptomonas in the Bugs Parasitic upon the Bat.*) ET. AND ED. SERGENT. Compt. rend. Soc. de biol., Par., 1921, **85**, 413–415.

Leptomonas and Leishmania forms are to be found in the insects which parasitize the bat. The presence of organisms of such types may be of interest in connection with the etiology of goitre.—G. H. S.

1923. Beobachtungen über Culiciden. (*Observations on Culicidea.*) B. GALLI-VALERIO. Centralbl. f. Bakeriol. (etc.), Jena, I. Abt., Orig., 1921, **86**, 31–33.

A record of observations on mosquitoes in the region of Lausanne, Switzerland. between October, 1918, and October, 1920. Notes were made on temperatures of the surroundings of larvae and pupae at various times of the year, likewise upon the breeding places and the biology and distribution of the culicides.—R. E. B.

TROPICAL DISEASES

1924. A Study of Tropical Sprue, or Psilosis. DAVID BOVAIRD. J. Am. M. Ass., Chicago, 1921, **77**, 753.

Tropical sprue is not sprue and is not confined to the tropics. Monilia has been found but once in 13 patients. The stools showed no bacterial change. Mouth lesions do not resemble sprue, caused by *Monilia albicans*. Severe anemia is frequent and hydrochloric acid is lacking in the gastric juice. The stools contain an excess of neutral fat.—P. G. H.

1925. Action du bismuth sur le Trypanosome du Nagana. (*The Action of Bismuth upon the Trypanosome of Nagana.*) R. SAZERAC AND C. LEVADITI. Compt. rend. Soc. de biol., Par., 1921, **85**, 430–431.

Injections of bismuth prolong the life of guinea pigs infected with the trypanosome of nagana. The average duration of life of animals so treated was 80 days as compared with 25 days in the untreated controls.—G. H. S.

1926. Action des sels de rhodium, de bismuth, de terres rares et de niobium dans le traitement du nagana chez la Souris. (*The Salts of Rhodium, Bismuth, the Rare Earths, and of Niobium in the Therapy of Nagana in Mice.*) A. FROUIN AND M. GUILLAUMIE. Compt. rend. Soc. de biol., Par., 1921, **85**, 446–448.

Niobium appears to be without effect upon experimental infection of mice with nagana, bismuth is active in prolonging life, as are the salts of the rare earths (cerium, yttrium). Rhodium chloride is also effective in increasing the resistance of the animal to the infection.—G. H. S.

MEDICAL ENTOMOLOGY

1927. Observations on the Ceratopogonine Midges of the Gold Coast, with Descriptions of New Species. Parts I and II. H. F. CARTER, A. INGRAM AND J. W. S. MACFIE. Ann. Trop. M. & Parasitol., Liverp., 1920, **14**, 187–274.

Small biting midges known as "sand-flies" are abundant in the Gold Coast and in many parts of the country are a vexatious pest. But little was known concerning them when the study was begun by two of the authors.

The present papers discuss methods of collecting, breeding and studying these minute forms. The bionomics of the species observed are briefly discussed.

The second paper is largely systematic in nature. A number of new species of *Culicoides* are described and keys to the species of the genus now known to occur in the Gold Coast are given.—W. A. R.

1928. Fish and Mosquito Larvae in Bengal, Bihar and Orissa, India. T. SOUTHWELL. Ann. Trop. M. & Parasitol., Liverp., 1920, **14**, 181–186.

In considering the utility of small fish as destroyers of mosquito larvae in the sections of India included, a peculiar problem arises.

During the early part of June the south-west monsoon-rains commence and in a short time the province is more or less flooded. By the middle of August the dry season commences and the flooded areas contract. During this season some of the larger predatory fish bury themselves in the mud and can exist there for months.

In order to remove these predatory fish which devour the larvae-eating fish, it would be necessary to pump the water areas dry and to allow them to remain dry in the sun for months. Even then one could not be certain that those buried in the mud might not spring to life again with the first rains. Further, it would be necessary to prevent the entrance of fresh broods of the predatory forms during the next flooded period.

Such extensive measures are regarded as clearly beyond the range of possibility. The small fish which normally devour mosquito larvae hence have a very limited usefulness in nature and this cannot be extended materially. The actual reduction of mosquitoes through the ageny of fish is not at present practical in that region.—W. A. R.

1929. Further Experiments with Anopheles plumbeus, Stephens; Its Infection with P. falciparum in England; also Notes on the Apparatus and Technique Employed. B. BLACKLOCK AND H. F. CARTER. Ann. Trop. M. & Parasitol., Liverp., 1920, **14**, 275–282.

Of 12 females of *Anopheles plumbeus* fed once on one or other of two cases of simple tertian malaria (*P. vivax*) and subsequently kept at room temperature (max. 22°C., min. 13°C.) none became infected.

Of 12 females of *Anophles plumeus* fed once on a case of malignant tertian malaria (*P. falciparum*) and subsequently kept at 28°C., none lived longer than 8 days after the infected feed; one contained oöcysts in the mid-gut.

Valuable notes on the technique employed and a description and photograph of the apparatus are given.—W. A. R.

PROTOZOOLOGY

1930. Councilmania lafleuri, a New Amoeba of the Human Intestine. C. A. KOFOID AND O. SWEZY. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 310–312.

Kofoid and Swezy describe a new species of intestinal ameba which was found in the stools of a returned soldier from over seas who had been confined to a hospital in France with dystentery. The stools in which the new species was found were wholly free from *Endamoeba dysenteriae*. The authors believe that this new species has added much to the confusion of previous investigators in their studies upon *Endamoeba coli*. A full description of the new species is presented in the report, also the differential characteristic which separates it from *E. coli*. It is designated as *Councilmania lafleuri* in honor of the two investigators who first clearly demonstrated the pathogenicity of the ameba.—L. W. F.

1931. On the Free, Encysted, and Budding Stages of Councilmania lafleuri, a Parasitic Amoeba of the Human Intestine. C. A. KOFOID AND OLIVE SWEZY. Univ. Calif. Publications in Zoology, Berkeley, 1921, **20**, 169–198.

There is described an ameba isolated from numerous samples of feces and collected from various portions of the United States and foreign countries. This organism which appears possibly to have a pathogenic rôle, heretofore has been confused with *Endamoeba dysenteriae*. Its resistance to fixing and staining fluids, its habit of engorging red blood corpuscles, and certain other characteristics differentiate it from that organism. Mainly on account of its habit of budding, it has been placed in a new genus by these two authors.

The description given is: Free stage with hyaline pseudopodia, abruptly formed, endoplasm filled with food vacuoles, and even ingested red blood corpuscles, resting nucleus with moderately thin zone of peripheral chromatin, karyosome generally excentric, often with small halo, in premitotic stages composed of dispersed particles and more nearly central in location. Pseudopodia broad, rounded, usually less than diameter of the body in width, generally single. Cysts with 1, 2, 4, or 8 nuclei, rarely more, thick walled, triple contoured, spheroidal, ellipsoidal, or asymmetrical, less frequently spherical. Nuclei of cysts with little peripheral chromatin and large, excentric or central, spheroidal, reniform, or lobed karyosome often divided into scattered particles, 8 chromosomes, and an intradesmose joining polar masses seen best in first and second mitoses. The cysts form a chromophile ridge from which cytoplasm emerges through a pore in the cyst wall as a chromophile bud. A nucleus migrates into the bud which detaches as an amebula. The process is repeated till the cyst is emptied of nuclei. Budding may occur in the bowel. Free stages from 63 by 35 μ to 20 to 35 μ when rounded up; spheroidal cysts 16 to 20, rarely 8 to 34, μ in diameter. Parasitic in the human intestine. Type species *Councilmania lafleuri*.—T. D. B.

1932. *The Variation in the Size of Trypanosoma brucei According to the Host.* T. D. Beckwith and W. W. Reich. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 316–317.

The statement has been made by some observers that certain species of trypanosomes may show differences in size according to the host infected, while other observers apparently have not found such variations. A study of the question was undertaken by Beckwith and Reich, who passed cultures of *Trypanosoma brucei* through both rats and guinea pigs. The heart blood, containing the organism, was studied from a series of 4 rats and 4 guinea pigs. Slide preparations were made from the blood as soon as possible after death, and stained with Wright's stain. The measurements were made by means of properly calibrated series of lenses, with a filar micrometer, upon 100 individuals from the guinea pigs, and 90 from the rats. All of the organisms measured were in the fully developed stage with typical morphology. It was found that the average size of *Trypanosoma brucei* in guinea pigs is 18.46 × 3.16 μ, while in white rats it is 13.25 × 2.23 μ. Statistical methods were applied to prove that these two series are comparable. Therefore the authors found that *Trypanosoma brucei* does vary in size according to the host infected. It is markedly larger in the guinea pig than in the white rat.—L. W. F.

1933. *Grégarines de Crustacés Amphipodes. Sur les Grégarines parasites du tube digestif du Gammarus pulex L.* (*Gregarines of Amphipod Crustaces. Gregarines Parasitic in the Digestive Tube of Gammarus pulex L.*) R. Poisson. Compt. rend. Soc. de biol., Par., 1921, **85**, 403–406.

The life history and morphological characteristics of *Gregarina longissima* (*Didymophyes longissima*) are presented.—G. H. S.

ANIMAL PARASITES

(*See also numbers 1907, 1908, 1909*)

1934. *Sur la source d'infestation par l'Eustrongle géant* (*Eustrongylus gigas Rud.*). (*The Source of Infestation by Eustrongylus gigas.*) J. Ciurea. Compt. rend. Soc. de biol., Par., 1921, **85**, 532–534.

At least 1 case of human infestation by *Eustrongylus gigas* has been observed in Roumania. The parasite is more frequently found in dogs. The suggestion is made that infestation results from eating fish in which the organisms are parasitic.—G. H. S.

1935. *Tartar Emetic in Guinea-Worm Infections.* J. W. S. Macfie. Ann. Trop. M. & Parasitol., Liverp., 1920, **14**, 137–146.

Including 10 cases previously reported details are now presented on the use of intravenous injections of tartar emetic for guinea worm in 23 patients and on 39 worms.

Excepting on rare occasions the drug was administered in doses of one grain each and was given every other day. The most suitable and convenient solution was made up with normal saline solution containing 0.5 per cent phenol, at a strength of 0.5 of a grain of tartar emetic to each cubic cm. It should always be freshly prepared before use.

Such injections will kill the worms and the embryos in them. Most frequently they remain in the body and are gradually absorbed. The injections appeared to relieve inflammation as well as to kill the guinea worms.—W. A. R.

1936. *Esboco de uma chave geraldos nematodes parasites.* (*Sketch of a General Key to the Nematode Parasites.*) Sauro Travassos. Rev. vet. zootec., Rio de Janeiro, 1920, **10**, 59–70.

The subject matter of this paper is sufficiently indicated by the title.—F. W. T.

EPIDEMIOLOGY

(*See also Number 2054*)

1937. *Unrecognized Infections in Production of Carriers of Pathogenic Organisms.* Charles F. Craig. J. Am. M. Ass., Chicago, 1921, **77**, 827.

Diphtheria, typhoid fever, malarial fever, and amebiasis are discussed in their relation to carriers. The author advocates greater attention by physicians to apparently trivial symptoms and to greater utilization of laboratory aids in diagnosis.—P. G. H.

1938. *Diphtheria Control.* Bernard W. Carey. J. Am. M. Ass., Chicago, 1921, **77**, 668.

The mortality of diphtheria has been markedly reduced since introduction of antitoxin, but the morbidity not as much so as was expected. The use of the Schick test and immunization with toxin-antitoxin mixture will greatly help in reducing the morbidity. Physicians should be educated to realize that we have the most powerful weapons to fight diphtheria. Intelligent study and treatment of carriers are also most desirable.—P. G. H.

INDUSTRIAL HYGIENE

1939. Syphilis and Industry. ALEC N. THOMPSON. J. Indust. Hyg., 1921, 3, 99.

The importance of periodic physical examination of industrial workers has for its objective the extension of life and the promotion of efficiency.

The routine Wassermann test, as a short cut to the detection of syphilis, has its impracticalities. In the periodic physical examinations "if any one, or a combination, of the following easily observable signals can be found, further detection of syphilis is necessary: ataxic gait; mental slowness; defective hearing; voice defects; pupils irregular, unequal, or reacting abnormally to light and accommodation; enlargement of the lymph glands, especially of the epitrochlear nodes; interstitial glossitis; leukoplakia; Hutchinson's teeth; scars not obviously due to injury; cardiac conditions; and altered reflexes, especially knee jerk."

When these signs are found, either singly or in combination, a Wassermann test should be made, and if "evidence suggestive of lues of the nervous system is ascertained, it should be a routine procedure to do a lumbar puncture with a serologic examination of the cerebrospinal fluid."—D. H. B.

1940. Oil Folliculitis. CALVIN G. PAGE. J. Indust. Hyg., 1921, 3, 62.

Staphylococcus aureus, Bacterium aerogenes, Bacterium coli, Bacillus subtilis are the bacteria most frequently found in oils. "It does not necessarily follow that infection of the skin will result from the use of oil contaminated by pus-producing bacteria." It seems desirable to use oil which has been rendered free from dust, and especially from particles of metal. Cleanliness on the part of the workrs, especially with regard to person and clothing is the most important safeguard against folliculitis.—D. H. B.

DISINFECTION AND GROWTH INHIBITION

(*See also Numbers 1970, 2059*)

1941. Concerning the Antiseptic Action of Some Aromatic Fumes. D. I. MACHT AND W. M. KUNKEL. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, 18, 68–70.

A number of gums, spices and other odoriferous substances were subjected to destructive distillation by heat, and the antiseptic effects of the fumes produced were studied on bacterial cultures. Gum olibanum, gum galbanum, storax, myrrh, saffron, cinnamon, benzoinum and various samples of domestic and Japanese incense were tested against *B. coli* and *B. pyocyaneus.* The tests were carried out in 3 series: (1) Smears of live organisms on agar slant tubes were subjected to the given fumes; (2) inoculated agar or gelatin plates were openly exposed under a glass bell jar in which incense was burned; (3) various spices individually or in combinations in powder form, were incorporated with the culture media, which were inoculated with the bacteria. Controls were made by burning filter paper (cellulose), raw cotton and various woods. It was found that the fumes from gum galbanum, gum olibanum, cinnamon and saffron prevented the growth of freshly transplanted bacteria, exerting a distinct antiseptic action, although if the growth was heavy the antiseptic action was not so marked, perhaps due to poor penetration. The fumes produced by destruction of various woods and also cotton gave similar results. Pure cellulose was not antiseptic in this respect. The culture media impregnated with various aromatics on inoculation with bacteria showed a distinct inhibitory effect on their growth. The fumes from the various forms of incense, produced a distinct antiseptic effect on growth of freshly inoculated plates when exposed for periods varying from 10 to 30 minutes in partially closed chambers.

The writers conclude that "the fumes produced by the burning or destructive dry distillation of various gums, spices, and other aromatic substances of a similar nature, certainly tend to exert an antiseptic action on the bacteria studied."—L. W. F.

1942. Mercury Saligenin, a New Antiseptic. A. D. HIRSCHFELDER, M. C. HART AND F. J. KUCERA. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, 18, 77–79.

The writers have prepared a mercury compound of saligenin whose sodium salt is water-soluble. They found that "solutions of this compound possess about the same antiseptic power as $HgCl_2$, i. e., 1:10,000 solutions kill staphylococcus, *Bacillus coli* and gonococcus in five minutes and *Streptococcus hemolyticus* in ten minutes in bouillon cultures, while in beef serum bouillon 1:500 solutions kill in five minutes." It is much less irritant to mucous membranes than is $HgCl_2$. They have also prepared an acetate of that compound, whose water-soluble sodium salt has equal antiseptic action with that of the mercury saligenin. Also a mercury compound of parahydroxymetanitrophenylcarbinol yielding a mono-mercury derivative was prepared whose sodium salt possessed the same antiseptic strength of the other two mercury compounds. The mercury saligenin was used with encouraging results in anterior gonorrheal urethritis. Saligenin, piperonyl alcohol and mercury saligenin have been used in chemotherapy in rats against trypanosomiasis (*brucei*) and spirillosis (*obermeieri*) with only negative results.—L. W. F.

1943. Ueber die durch Metalle, Metallsalze und flüchtige Desinfizienten hervorgerufenen keimfreien Höfe auf Bakterienplatten. (The Sterile Zones Produced by Metals, Metal Salts and Volatile Disinfectants upon Bacterial Plates.) Alfred Luger. Wien. klin. Wchnschr., 1920, **33**, 833–836.

An effect at a distance could not be demonstrated for mercuric chloride, for copper or for silver. In the case of mercuric chloride, sublimation actually transfers some of the poison to the plates. The sharp zone formed about metals and salts upon plates is due to ordinary diffusion processes characteristic for gels. Liesegang's phenomenon is also observed in these experiments.—B. C.

1944. La bactériolyse en série par le violet de méthyle. (Bacteriolysis by Methyl Violet.) A. Botez. Compt. rend. Soc. de biol., Par., 1921, **85**, 585–586.

In appropriate quantitative relationships between culture and bacterial suspension *B. diphtheriae* is completely lysed in 24 hours; *B. anthracis* in 24 hours; *B. dysenteriae* more slowly (48 hours); and pseudodiphtheria strains only with difficulty. With this last organism lysis of bacterial cells does not take place until after the capacity of the organism to reduce the dye has been exhausted.—G. H. S.

1945. Ueber die desinfizierende Wirkung der Cupfersalze. (The Disinfectant Action of Copper Salts.) Hildegard Mittelbach. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt., Orig., 1921, **86**, 44–49.

Various salts of copper were studied as to their germicidal power toward *Micrococcus pyogenes aureus, Bacterium coli, Bacillus anthracis, Vibrio cholerae* and *Cornyebacterium diphtheriae*. It is concluded that the soluble copper salts possess considerable disinfecting value. There are marked differences in the behavior of the same copper salt toward the different bacteria. The activity of copper salts are in general proportional to their copper content. Copper chlorate possesses certain advantages in practice over copper sulphate. The copper salts are more efficient in protein-free media.—R. E. B.

1946. Die Entkeimung von Obst und Gemüse durch Chlorkalk. (Sterilization of Fruits and Vegetables by Bleaching Powder.) Henrich Herfarth. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt., Orig., 1921, **86**, 33–44.

Various fruits and vegetables purchased from dealers show the presence more or less constantly of *Bacterium coli*. They must therefore be assumed to be contaminated with fecal material. Since typhoid, dysentery and cholera bacteria are known to persist for some time on the surfaces of such foods, there is a chance of disease being spread through their use. Methods of disinfection with bleaching powder are detailed.—R. E. B.

WATER AND SEWAGE BACTERIOLOGY

1947. Zur Bestimung und Hygienischen Bedeutung des Colititers (das Hermannstädter Ozonwasser). (The Determination and Hygienic Importance of the Number of B. coli in the Ozone-treated Water in Hermannstadt.) Wilhelm Stern. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1921, **54**, 209–214.

The author suggests the following method for determining the numerical presence of *B. coli:* To 100 cc. of medium consisting of 5 per cent peptone, 5 per cent lactose, 2.5 per cent sodium chloride 0.5 per cent of a 10 per cent alcoholic fuchsin solution, and 2 cc. of a freshly prepared 10 per cent sodium sulfite solution are added. Two cc. of this mixture is placed in each of a series of 14 tubes. 10 cc. of the water under examination are added to tubes I–II; 5 cc. water and 5 cc. sterile salt solution to III–IV; 2.5 cc. water and 7.5 cc. sterile salt solution to VII–VIII; 1 cc. water and 9 cc. salt solution to IX–XII; 0.5 cc. water and 9.5 cc. salt solution to XIII–XIV. When the water is very rich in *B. coli*, it is diluted with sterile salt solution, and samples of 0.1, 0.5, 1 cc. are used. When the water is poor in *B. coli*, 25, 50, 100, and 500 cc. portions of water with the necessary amount of medium are placed in large flasks. The cultures are placed in the incubator at 37° C. and the results determined: the presence of coli is indicated by a red color. The "coli-titer" is then determined arithmetically for 100 cc. of water, as follows: $a:b::100:x$, in which a is the number of water portions in which coli is only occasionally present, b is the number of positive tests and x is the "coli-titer."

While the number of bacteria, after heavy rainfalls, may give no indication of the impurity of the water, the "coli-titer" may indicate a strong pollution.—S. A. W.

FOOD BACTERIOLOGY

(See also Numbers 1946, 2041)

1948. Differentiation of Type A and Type B Botulinus Toxins in Food: A Rapid and Simple Method. Robert Graham and Herman Schwarze. J. Am. M. Ass., Chicago, 1921, **76**, 1743.

Experimental tests have shown that chickens are susceptible to Type A toxin but highly refractory to Type B toxin. Type A may be associated with avian botulism to the exclusion of Type B. In the experiments 1 to 5 cc. of liquor from the suspected food was given to mature

chickens and 25 to 50 grams of the suspected food in solid form. If Type A is present paresis and coma are manifest in a few hours. If the chickens remain healthy the intoxication may be caused by Type B, although this must be determined by bacteriologic and immunologic tests. Sometimes when the food has been discarded it may have been fed to chickens and produce the symptoms characteristic of poisoning with Type A.—P. G. H.

1949. *Some Suggestions concerning the Bacteriological Diagnosis of Human Botulism.* K. F. Meyer and J. C. Geiger. Am. Food J., 1921, 16, 29–30.

Methods are given for making cultures from tissue and stool specimens for *B. botulinus.* The authors review results obtained from bacteriological examinations of tissues and stools in 4 outbreaks of botulinus poisoning. Spleen cultures made in 2 instances were negative for *B. botulinus.* Stool specimens from 2 cases in different outbreaks contained *B. botulinus,* Type A, on sixth, seventh and eleventh day after consuming the poisonous food. The importance of making cultures from the stools and tissues of all cases of botulism is evident.—E. L.

1950. *Botulism; a Study of the Action of the Toxin of B. botulinus upon the Living Tissues.* E. C. Dickson and R. Shevky. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, 18, 313.

In experiments on cats, dogs, and rabbits, it was found that the toxin of *B. botulinus* did not impair the upper and lower neurones of the skeletal motor nerve supply, nor disturb the spinal reflex arcs of the extremities. The nerve impulses were blocked in the nerves of the non-sympathetic portion of the involuntary nervous system, for example, the vagus nerve, the chorda tympani and the nervi erigentes. Apparently the blocking is of a temporary nature, relatively unstable, and not due to organic destruction of the nerve elements.—L. W. F.

1951. *Concerning Toxic By-Products of Bacillus botulinus.* J. Bronfenbrenner, M. J. Schlesinger and P. F. Orr. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, 18, 181–182.

Orr observed that mice receiving botulinus toxin in gradually increasing amounts frequently died within a few minutes after an injection of 0.5 cc. of the culture filtrate. It has been found that the acute intoxication of the mice is due to poisonous products produced by *B. botulinus* other than the specific toxin, and are not neutralized by the specific antitoxin. Cultures of "atoxic" strains of *B. botulinus, B. sporogenes, B. tetani,* and *B. proteus* when grown on medium composed of minced-meat broth yielded similar products. As to the nature of these toxic products, it was found that when *B. botulinus* is grown on a suitable medium, and such a culture is filtered through a Berkefeld candle, the addition of alcohol to the filtrate fails to precipitate the secondary toxic products. The alcohol extract equivalent to 0.5 cc. of the original filtrate when injected intraperitoneally into mice (17 to 22 gm.) causes death. These toxic products are dialyzable, also they are thermostable, not being destroyed even in the autoclave when heated in a sealed tube. Their toxicity diminished with coincident volatilization of basic products in the presence of strong alkali in the open container. It is evident that these products are chemical by-products of the bacterial metabolism, and not of the nature of bacterial toxins. Owing to the source of error which these products may introduce in connection with examinations of partly decomposed food products (when toxins are suspected), the writers wish to emphasize the necessity of controlling such animal inoculations by antitoxin neutralization experiments. If the antitoxin is not available the thermostability of the toxic substances in neutral as well as alkaline reactions may indicate the true nature of the substances.—L. W. F.

1952. *The Composite Nature of Botulinus Toxin.* J. Bronfenbrenner and M. J. Schlesinger. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, 18, 254.

It has been found that the lethal dose of botulinus toxin by mouth is roughly 1000 removed from that sufficient to kill by the intraperitoneal route. The same relationship between dosage seems to hold true for all laboratory animals, including birds. Toxin purified by precipitation retained its full potency when tested by injection, but became 100 times less toxic by mouth. The further purification was carried, in general the greater was the loss of potency of purified toxin when given by mouth. By adding substances removed by the process of purification to the purified toxin, the toxicity by mouth was reestablished. It would appear, therefore, "that the power of crude botulinus toxin to be absorbed through the intestine is dependent upon the presence of secondary substances mixed with the true botulinus toxin."—L. W. F.

1953. *The Precipitation of Botulinus Toxin with Alcohol.* J. Bronfenbrenner and M. J. Schlesinger. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, 18, 304–305.

Ethyl alcohol, even in weak solution (20 to 30 per cent), in the course of 5 to 10 minutes destroys many thousand lethal doses of botulinus toxin *in vitro,* when placed in a water bath at 37°C. Other toxins, such as tetanus or diphtheria toxins, are much more resistant to the destructive effects of alcohol. In several outbreaks of botulism it has been observed that those who had partaken freely of alcoholic beverages while eating the incriminated food either escaped, or were not so severely affected as those who had not taken the alcohol along

with the food. It was assumed by the writers that the alcohol afforded the protection in such cases by its direct destructive effect on the toxin in the stomach. Experimental tests were made upon guinea pigs to determine if possible the validity of the assumption. Two series of animals, each of equal weight, received sufficient botulinus toxin, *per os*, to kill them in 24 to 48 hours. In one series each pig received, *per os*, 6 cc. of 30 per cent alcohol following the toxin; the other series received no alcohol. Those of the latter group died within the usual time, while the alcohol treated animals survived and appeared normal 2 weeks after the experiment. If the toxin is given *per os*, and the alcohol (in large amounts) subcutaneously, the animals die within the usual incubation period observed in the controls. Also the same thing occurs if the alcohol is administered by mouth and the toxin is given intraperitoneally. These tests would indicate that the alcohol only exerts a direct destructive action.—L. W. F.

1954. Sur les cellules a mucus de l'huître (Ostrea edulis L.) et la mycose de Pettit. (The Mucus Cells of the Oyster and the Mycosis of Pettit.) ROBERT PH. DOLLFUS. Compt. rend. Soc. de biol., Par., 1921, **85**, 449–452.

The mycosis mentioned is ascribed to *Nocardia matruchoti* by Pettit although the organism does not appear to present any of the characters of the Nocardia. Eyre has isolated an organism to which is given the name *Cladothrix dichotoma*. The relation of these organisms to the death of the oyster is discussed.—G. H. S.

1955. Heat Penetration in Canning with Reference to Microbial Spoilage. ZAE N. WYANT. Canner, Chicago, 1921, **52**, 27–31.

A review of the work that has been done on this subject. The experiments carried on have been to determine: 1. How the type of food product affects the rate of heat penetration; 2. how the density of packing affects the rate of heat penetration; 3. how the consistency of the material being canned affects the rate of heat penetration; 4. how the hydrogen ion concentration or true acidity of the liquor affects the time required for effectual processing; 5. at what rate heat should be applied, and the effect of the initial tenperature of the processing medium or apparatus and of the food product itself upon the internal can temperature; 6. the length of time taken for the center of the can to reach the maximum temperature; 7. the effect of agitation on the rate of heat penetration; 8. the effect of the size and type of can upon the heat penetration; 9. the effect of the type of processing medium or apparatus used; 10. the length of time the can should be held at the maximum temperature and the safety factor; 11. the rate of cooling, including the time taken for the temperature to drop from 167°F. to 113°F., the growing range of most thermophiles, and also from 113°F. to 68°F., that of other common contaminating organisms; 12. storage temperature.

The results obtained from experiments are briefly given with references to the literature, which are, however, given in incomplete form.—R. S. B.

1956. Bacteriology in Relation to Commercial Meat Products. A. M. WRIGHT. N. Zealand J. Agric., **22**, 102–106.

The general outlines of methods for preserving meats are given with special reference to freezing and the use of heat in checking bacterial action in canned meats of various kinds.

The author found that 127°C. for 15 minutes would destroy all forms, either spores or vegetative, of bacterial growth. The vegetative cells, however, could be killed by using a dry heat of 120°–130°C., while if moisture was present only 66°C. was needed.

In various experiments where meat was allowed to come in contact with putrefying organisms and the meat frozen during the period, a temperature of 15°–20°C. below the freezing point was found to check the growth of these types in the meat. The organisms would not invade the meat when this temperature was constantly regulated but if higher temperatures were used the meat at once showed evidences of putrefaction.—G. J. H.

1957. Forschungsergebnisse auf dem Gebeite der Essigbakteriologie und Fortschritte der Gärungsessigindustrie. (Investigations in the Field of Acetic Acid Bacteria and Advances Made in the Industry of Acetic Acid Fermentation.) ALEXANDER JANKE. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1921, **53**, 81–124.

A review of the investigations carried out with acetic acid bacteria and of the technology of acetic acid fermentation covering the period between the fall of 1912 and the fall of 1920. It includes the following sections: I. comprehensive studies in the field of acetic acid bacteria and acetic acid technology; II. morphology and systematic consideration of acetic acid bacteria; III. physiology of acetic acid bacteria; IV. acetic acid and its analysis; V. the industry of acetic acid fermentation; VI. the utilization of acetic acid bacteria and acetic acid fermentation for special purposes.—S. A. W.

1958. Pink Sauerkraut, Its Cause and Its Prevention. E. B. FRED AND W. H. PETERSON. Canner, Chicago, 1921, **53**, 4 pp.

A preliminary account of a study of one of the commonest troubles connected with the commercial preparation of sauerkraut. The authors report their conclusions as follows:

The pink or red color of sauerkraut is due to the growth of certain yeasts or torulae. Although these organisms are commonly found in great numbers in kraut they frequently fail to show any pigment. The production of pigment is not a fixed characteristic, but depends upon many factors. The following conditions influence the formation of color: kind of sugar, amount of sugar, amount of sodium chloride, reaction, temperature, and oxygen supply. The chief factors in the production of pink sauerkraut are temperature, high salt concentration and high acid content. When cabbage is allowed to ferment at a temperature of 20°C. or above, a pink pigment is frequently noted. Almost without exception, cabbage fermented in the presence of large amounts of sodium chloride, 3 per cent or more, showed a decided pink or red color. High acid producing bacteria as well as the direct addition of acids to cabbage favor the development of pink kraut.—R. S. B.

1959. Report of the Food Investigation Board of the Department of Scientific and Industrial Research—England for 1919. Brit. Food J., Lond., 1921, **269**, 32–33.

It is well known that bacteria growing in a particular medium after a period of multiplication gradually die off. This is shown by Graham-Smith to be due not to the accumulation of toxic products of their own activity but to the exhaustion of some specific food material. It was also shown that bacteria of another species are able to grow in a medium which has been exhausted by a different species so far as its own growth is concerned.

It was shown by researches on the "black spot" mold (a species of Cladosporium) that it will grow at a temperature of -5°C. It was clear that the protoplasm in the cells does not freeze, although the expressed juices of plants usually freeze between −2° and −3°C. No doubt capillary forces are responsible for the lowering of the freezing point in the narrow cells.—E. L.

DIATHETIC AND DEFICIENCY DISEASES—VITAMINES

1960. The Antigenic Properties of Ragweed Pollen. J. T. Parker. Proc. Soc. Exper. Biol. Med., N. Y., 1920-21, **18**, 237-240.

Guinea pigs were sensitized by repeated intraperitoneal injections of weakly alkaline extracts of ragweed pollen. These solutions gave the Millon and the xanthoproteic reactions for protein. Sensitizaton of the animals was tested by the Dale method on the isolated uteri; control tests were made in the same way with normal pigs. The author fully reports the method employed to extract the pollen, and the technic of the tests, including graphic records of the same. The tests showed a definite sensitization of the animal when the Dale method was used, which demonstrated the antigenic nature of ragweed pollen extracts. As to the anaphylactic nature of hay fever, the author does not wish to draw any theoretical conclusions at the present time.—L. W. F.

CANCER RESEARCH

(See Numbers 1898, 1973)

DISEASES OF THE CIRCULATORY SYSTEM

1961. A Case of Right-Sided Endocarditis (Streptococcus viridans). F. H. Dieterich. Proc. N. York Path. Soc., 1920, **20**, 5–9.

Dieterich reports a case which was admitted to the hospital suffering from heart disease. Among the data noted in the history and the results of laboratory examinations was a blood culture which showed *Streptococcus viridans*. An autopsy performed on the body of the patient showed as the most noteworthy lesion numerous warty vegetations on the tricuspid valve. In places the vegetations were firm and pearly white, in others pinkish and rather friable; their size varied from 0.5 to 7 mm. Aside from a few atheromatous plaques at the base of the mitral valve, and a small vegetation on the anterior cusp of the aortic valve, the left heart was not involved. A perforation was found in the interventricular muscular septum. The opening was oval (2.5 × 1 mm.) on the left side of the heart, while on the right side it was round (2 mm. in diameter). The margins of both openings of the perforation were surrounded by very small pinkish vegetations, rather warty in character, upon a pale sclerotic rim. *Streptococcus viridans* was grown from post mortem blood culture.—L. W. F.

DISEASES OF THE DIGESTIVE SYSTEM

(See also Numbers 1992, 2033)

1962. Studies on Intestinal Implantation of Bacillus acidophilus. H. A. Cheplin and L. F. Rettger. Proc. Soc. Exper. Biol. & Med., N. Y., 1919–20, **17**, 192–195.

The inetstinal tract of the albino rat and of man commonly harbors the *B. acidophilus* (Moro), ordinarily present in very small numbers. It is a well recognized fact that diet exerts a marked influence upon the character of the intestinal flora, in particular, lactose and dextrin when taken in sufficient quantities. Similar changes may occur when pure cultures or suspensions of *B. acidophilus* are ingested. When 2 gm. of either lactose or dextrin were administered to white rats in connection with a basal diet of bread and meat, a complete transformation of the fecal flora followed within 3 to 6 days—the ordinary mixed type of fecal organisms changed to one dominated by *B. acidophilus*. A partial change was induced by giving 1 gm. of either of the sugars. No change took place if the same amounts (2 gm.) of the maltose, sucrose, or glucose were given. If 2 cc. culture (standard suspension) of the organism alone is administered, the change occurs, or if 1 cc. culture with 1 gm. of lactose or dextrin is given. Post mortem examination of the intestinal tract of the rat reveals a general distribution of the organism throughout its entire length. *B. bulgaricus* when given in 5 cc. amounts (standard suspension) either with or without accompanying lactose failed to become implanted. But when given simultaneously with lactose, a transformation of the intestinal flora took place corresponding to that obtained with the feeding of 2 gm. of lactose alone.

Lactose or dextrin feeding experiments causes a pronounced transformation in the intestinal flora of man within 4 to 6 days — when the carbohydrate is added in sufficient amounts to the ordinary diet. In such case, the *B. acidophilus* shows a marked predominance. The ingestion of 300 gm. (with one exception) of either of these carbohydrates led to such a proliferation of *B. acidophilus* that it entirely dominated the flora; the other viable bacterial types were almost completely suppressed. This tended to remain permanent as long as the carbohydrates were ingested. If 150 gm. of lactose or dextrin were taken no radical change occurred, except in two cases. But if 150 cc. of living culture of *B. acidophilus* were added to 150 gm. of lactose or dextrin, a marked change in the fecal flora to the aciduric type took place. Also the daily ingestion of 300 cc. of the living *B. acidophilus* culture effected the transformation of the fecal flora in the same way. *B. acidophilus* implantation in the alimentary canal may be brought about by the use of milk soured with *B. acidophilus*, in conjunction with the usual diet. If one liter is taken (*per os*) daily, a non-gas-producing intestinal flora dominated by *B. acidophilus* may be effected in 1 to 6 days — usually in less than 3 days. Even 500 cc. of milk have given similar results; the addition of 100 gm. lactose or dextrin to the latter quantity gives rapid results.

The question of the rate of absorption from the alimentary canal of a utilizable carbohydrate and its effect on the transformation of the intestinal flora is discussed by the writers.—L. W. F.

1963. Further Studies on Intestinal Implantation of Bacillus acidophilus. H. A. Cheplin and L. F. Rettger. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 30–32.

Further studies upon the question of transformation of the intestinal flora of man fully confirm the earlier conclusions, which the writers have previously reported. A continuation of the studies has developed a technic for the preparation of *B. acidophilus* milk with uniform physical and chemical properties. Stock strains, preferably mixed strains, are grown sufficiently long in milk to bring about light curdling within a 24-hour period. This usually results after an overnight incubation; never incubate longer than 24 hours. The organisms retain their characteristics over a prolonged period when cultured in this way. The quality of the milk at the time of the preliminary sterilization influences the character of the soft curd produced in subsequent inoculation. More or less acidity of the milk tends to give a final product of uneven consistency, granules and lumps of curds. The successfully prepared *B. acidophilus* milk should be of a uniform creamy consistency with only a very thin layer of whey at the surface. Some particles of a thin film formed during the previous sterilization in preparation for culturing may also be present. No odor suggestive of ordinary bacterial decomposition should be present, instead the odor should be slightly aromatic. Taste as well as odor should be pleasant. Little change occurs on standing at ordinary or refrigerator temperature if the milk remains without contamination. The acidity always remains under 1 per cent and undergoes but little increase after the initial incubation period. The authors, from studies upon a number of clinical cases in which the milk has been used, suggest that it apparently possesses value as a therapeutic agent in certain conditions.—L. W. F.

1964. Collection phlegmoneuse a Bacilles d'Eberth au cours de la fièvre typhoïde. (*Localized B. typhosus Phlegmon During Typhoid Fever.*) A. Botez. Compt. rend. Soc. de biol., Par., 1921, **85**, 589–590.

A case is reported in which *B. typhosus* was isolated from the blood culture and also from a localized lesion upon the forearm. Both strains were culturally alike; the blood strain was readily agglutinable, the other strain but slightly agglutinable.—G. H. S.

1965. Un cas d'abcès périnéphrétique a Bacilles typhiques. (*Perinephritic Abscess Due to B. typhosus.*) Casimiro Affonso. Compt. rend. Soc. de biol., Par., 1921, **85**, 601–603.

The case is presented in detail. *B. typhosus* was isolated in pure culture from a perinephritic abscess.—G. H. S.

DISEASES OF THE GENITO-URINARY SYSTEM

(*See also Numbers 1892, 1893, 1939, 1942, 1965, 2066, 2069, 2070, 2071, 2077*)

1966. Étude expérimentale de l'hérédité syphilitique. (*Experimental Hereditary Syphilis.*) C. Levaditi, A. Marie and L. Isaïcu. Compt. rend. Soc. de biol., Par., 1921, **85**, 342–344.

Report on an extended study of the hereditary transmission of syphilitic infection in rabbits. Whatever the type of Treponema used;—the dermotropic strain (virus of Ravaut or the virus of Fournier-Schwartz), the neurotropic strain (from the blood of a case of general paralysis), or the *Spirocheta cuniculi*;—no certain evidence of inheritance of the infection has been obtained. The issue of a mating with either the one or the other parent syphilitic or with both parents syphilitic frequently dies immediately after birth or within a few weeks but in such cases spirochetes can not be demonstrated in either the blood or the organs. Nor can spirochetes be demonstrated in the fetus (*in utero*) when examined after the death of the syphilitic mother occurring during the period of gestation. Results of this type repeatedly occur in spite of the fact that the parents show multiple syphilitic lesions and have been infected for more than a year. No modification in the spermatogenesis can be detected in syphilitic males. Experimentally the descendants of a syphilitic parentage do not appear to possess any increased resistance to infection, thus opposing Profeta's law.—G. H. S.

1967. On the Generalization of Treponema pallidum in the Rabbit Following Local Inoculation. L. Pearce and W. H. Brown. Proc. Soc. Exper. Biol. & Med., N. Y., 1919–20, **17**, 164–166.

In isolated instances, it has been shown that a widespread dissemination of *Treponema pallidum* followed local inoculation in rabbits. In such instances the organism has been recovered from the blood, lymph nodes, or other organs. Occasionally generalized lesions occurred in infected animals. No data were available concerning the time or frequency of such disseminations, or whether the distributed organisms were capable of sustaining the infection in the animals. Therefore the writers undertook a series of experiments to determine the frequency of invasion of the regional lymph nodes and the general circulation following inoculation into the scrotum or testicles, and how soon a self-sustaining generalized infection may be established. An outline of the various groups of tests is given, and the results noted. The following conclusions were drawn: "These experiments show that following a local inoculation of well adapted strains of *Treponema pallidum* there is an immediate invasion of the tissues of the animal and that within a very short time organisms may be recovered from both the regional lymphatics and the circulating blood. They also show that the blood stream infection tends to pursue a course parallel with that of the primary lesions. Finally, it was shown that within 48 hours or less a true generalized infection had been established which was capable of maintaining the infection in the animal independent of that at the site of inoculation."—L. W. F.

1968. Improved Methods for Staining Spirochaeta pallida in Tissue. A. S. Warthin and A. C. Starry. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 82–84.

The writers recommend two methods for the staining of spirochetes in single sections of tissue mounted upon cover-glasses, which give satisfactory results. The methods as published are as follows:

I. Warthin and Starry's Cover-Glass Method.

"1. Fix tissues in 4 per cent formol.

"2. Wash thoroughly in distilled water.

"3. Imbed in paraffin (alcohol, xylol, paraffin).

"4. Cut; mount sections on cover-glasses with albumin fixative.

"5. Remove paraffin from section (xylol, alcohol, water).

"6. Place cover-glass in a saturated solution of ferric alum, or a 4 per cent solution of ferrous ammonium sulphate, in incubator for 1 to 2 hours.

"7. Wash in distilled water.

"8. Rinse cover-glass with section in a 2 per cent silver nitrate solution. Cover section with another perfectly clean cover-glass which has also been rinsed in the silver solution, so that the cover-glasses are held together by capillary attraction. Then place them carefully on the bottom of a wide-mouthed dark bottle covered with black paper, and cover them with the silver nitrate solution. Cork tightly, and put into incubator for 3 to 24 hours.

"9. After impregnation pour off the silver nitrate solution and rinse in distilled water without removing cover-glasses from bottle, by pouring the water into the bottle, shaking gently, and then pouring off.

"10. Pour reducing fluid (pyrogallic acid, 4 grams; 40 per cent. formol, 5 cc.; distilled water, 100 cc.) into the bottle. See that fluid passes between cover-glasses by pressing upon them with a glass rod, or by shaking. Reduction is almost instantaneous; it should occur evenly over the section or brown lines will result. After 2 to 3 minutes remove cover-glasses, separate, wipe off with a cloth any precipitate on the albumin fixative about the section, taking care not to touch the latter.

"11. Wash in distilled water.

"12. Dehydrate in absolute alcohol, clear in xylol, then balsam.

"The reduced section should have a faint, dull brownish-yellow color. If the color is bright yellow the organisms will be poorly stained. The spirochetes should have a deep reddish brown color contrasting sufficiently well with the background, if the procedure has been successful."

II. Warthin and Starry's Silver-Agar Cover-Glass Method.

"1. Fix tissue in 4 per cent neutral formol.

"2. Imbed in paraffin (absolute alcohol, xylol, paraffin).

"3. Cut, mount sections on cover-glasses with albumin fixative.

"4. Remove paraffin (xylol, alcohol, water).

"5. Rinse cover-glass with section in 2 per cent silver nitrate; cover wet section with another perfectly clean cover-glass, so that they are held together by capillary attraction; then place them carefully in a bottle of 2 per cent silver nitrate, and place in incubator for 30 to

60 minutes; then remove the silver nitrate and separate cover-glasses. They must not separate while in the solution.

"6. Place cover-glass with section in the following reducing mixture:

	cc.
2 per cent silver nitrate solution	3
Warm glycerin	5
Warm 10 per cent aqueous gelatin	5
Warm 1½ per cent agar suspension	5
5 per cent aqueous hydroquinone solution	2

"7. Reduce until section is a light reddish brown (several seconds); remove and rinse in 5 per cent sodium hyposulphite solution.

"8. Rinse in distilled water. Clean off with a cloth and precipitate on the cover-glass.

"9. Absolute alcohol-xylol-balsam.

"The mounted section should have a light reddish brown color; if too deep brown or black the spirochetes will not be sufficiently contrasted. They should appear dark reddish brown to jet black against a very light brown background.

"In some cases of poor fixation of the tissue with poor staining of the spirochetes we have found that if the sections before being put into the silver solution are treated for several minutes in a 1 per cent solution of uranium or copper nitrate, or a 0.5 per cent solution of ferric alum, the tissue-reaction is changed in some way so that good staining results. These solutions do not act uniformly in all cases. After their use the section must be thoroughly washed in distilled water before it is put into the silver nitrate solution."—L. W. F.

1969. Urinary Antisepsis—The Secretion of Antiseptic Urine by Man Following the Oral Administration of Proflavine and Acriflavine. Preliminary Report. E. G. Davis. J. Urol., Balt., 1921, **5**, 215–234.

Cultural tests were made to determine the antisepsis of urine for the staphylococcus and colon bacillus following the oral administration of proflavine and acriflavine to normal individuals.

It was found that doses of 0.05 to 0.1 gram were secreted in the urine sufficiently after 2 hours to prevent bacterial growth if the reaction of the urine was alkaline. The antiseptic action persisted for 8 hours.—R. D. H.

1970. The Action on the Gonococcus of Various Drugs Commonly Used in the Prophylaxis and Treatment of Gonorrhea. E. O. Swartz and D. M. Davis. J. Urol., Balt., 1921, **5**, 235–248.

A series of experiments was carried out to determine the germicidal power of various drugs in common use for prophylaxis and treatment of gonorrhea.

The silver compounds, silvol, cargentos, argyrol, and protargol, have approximately the same germicidal power. The gonococcus is killed with dilutions of 1:400 to 1:800. Phenol, tricresols, potassium permanganate, zinc sulphate, and boric acid have insufficient germicidal value to be of use in the urethra. Chlorazene has a moderate and potassium mercuric iodide a high germicidal value.—R. D. H.

1971. Ueber die Zahl der intra- und extraleukozytären Gonokokken. (On the Numbers of Intra- and Extra-leucocytic Gonococci.) Meta Oelze-Rhienboldt. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt., Orig., 1921, **86**, 29–31.

The maximum number of gonococci found within a leucocyte in gonorrheal pus was 122. The average number found in leucocytes with segmented nucleus was 18, in the polynucleated cells the average was 32.—R. E B.

1972. Die spontan auftretende Prostatitis durch Colibakterien. (Spontaneously Occurring B. coli Prostatitis.) F. Suter. Schweiz. med. Wchnschr., 1921, No. 32, 733–737.

Spontaneously occurring *B. coli* prostatitis is relatively rare as compared with infection of this nature associated with instrumentation. The route of spontaneous infection is undetermined; it may either be an ascending urethral infection or an endogenous blood stream infection. A posterior urethritis was present in all of the cases reported.—G. H. S.

1973. A Study of Tumors of the Vesical Neck and the Prostatic Urethra and Their Relation to the Treatment of Chronic Prostatitis. L. P. Player and C. P. Mathé. J. Urol., Balt., 1921, **5**, 177–210.

The 3 morphological types of tumors as observed through the cysto-urethroscope were; (a) true polypi with pedunculated bases, (b) polypoid masses with sessile bases, and (c) simple edematous excrescence.

Photomicrographs and histological descriptions of the tumors are included. They consist of glandular or connective tissue with a general infiltration of round cells, polymorphonuclear leucocytes and plasma cells associated with chronic granulation tissue.

The prostate and seminal vesicles are thought to be reinfected from this source of irritation and chronic infection. Marked improvement resulted after the removal of the tumors in 73 per cent of the cases.—R. D. H.

DISEASES OF THE NERVOUS SYSTEM

(*See also Numbers 1848, 1849, 1850, 1892, 1918, 1985, 2037, 2039, 2043*)

1974. Affinités neurotropes du virus de la vaccine. (*Neurotropic Affinity of Vaccine Virus.*) C. LEVADITI, P. HARVIER AND S. NICOLAU. Compt. rend. Soc. de biol., Par., 1921, **85**, 345–347.

In conducting a study of various neurotropic viruses experiments were performed with the virus of vaccinia. Fresh virus inoculated directly into the brain failed to induce lesions but if this strain had been passed several times through rabbits by intratesticular inoculation it then became pathogenic and caused a fatal infection. The brain tissue of animals infected with this virus was culturally sterile but the presence of a virus was shown by serial passage. Such a virus caused a keratitis, an orchitis, and a cutaneous eruption, as well as an encephalitis. No crossed immunity between the virus of vaccinia and that of epidemic encephalitis could be shown. Vaccinia virus differs from that of encephalitis in that the first can not be maintained indefinitely by nervous system passages. After two serial inoculations through the nervous system a testicular passage was necessary. Intracerebral inoculation of vaccine virus causes a meningo-encephalitis with involvement of the dura mater, the pia, and the cerebral cortex. In the dura pustule formation takes place with the formation of adhesions. There is a polymorphonuclear infiltration. The pia mater shows a mononuclear meningitis of the perivascular type.—G. H. S.

1975. Comparison entre les divers ultra-virus neurotropes (ectodermoses neurotropes). (*Comparison of Different Neurotropic Viruses.*) C. LEVADITI. (Discussion by A. NETTER.) Compt. rend. Soc. de biol., Par., 1921, **85**, 425–429.

The viruses of variola, encephalitis, rabies and poliomyelitis are compared with respect to their affinities for cutaneous and nervous tissues. The properties of the viruses may be tabulated as follows:

	AFFINITY FOR			
	Cutaneous tissue	Corneal tissue	Cerebral tissue	Medullary tissue
Vaccinia-Variola	Maximal	Maximal	Moderate	Moderate
Encephalitic group:				
Salivary-keratogenic	Maximal	Maximal	Moderate	Absent
Herpes labialis				
Salivary virus of carriers	Maximal	Maximal	Maximal	Moderate
Virus from nervous tissue				
Rabies virus	Absent	Moderate	Maximal	Maximal
Poliomyelitic virus	Absent	Absent	Absent	Maximal

It is thus apparent that although the viruses are specifically different they apparently belong within the same group.—G. H. S.

1976. Experimental Studies in Encephalitis Lethargica. L. LOEWE AND I. STRAUSS. Proc N. York Path. Soc., 1920, **20**, 18–46.

Strauss, Hirschfeld and Loewe previously reported that epidemic encephalitis was due to a filtrable virus, which by suitable methods could be cultivated, and the organism demonstrated. In the present paper, the experimental work leading to those results, with additional investigations, is fully reported. The gross and histological lesions produced by the disease in the central nervous system of man and in inoculated animals are described. The methods employed in preparing the virus for inoculation purposes, the sources of the virus (brain, spinal fluid, naso-pharynx) and the mode of inoculation, are fully treated. The animals used in the tests were monkeys and rabbits, which gave satisfactory results. All of the experiments were very carefully controlled from numerous standpoints. The relationship of epidemic encephalitis to poliomyelitis, and to influenza, is discussed, but in the light of their findings, the authors feel that they have proved it to be a new clinical entity. Of special interest are the results by cultural methods; an organism has been cultivated through a number of generations, which will reproduce the disease in experimental animals and it is considered to be the etiological agent producing the disease. It will not develop on the ordinary laboratory media under either aerobic or anaerobic conditions. By means of the tissue-ascitic fluid medium of Noguchi, and by following the technic which he recommends, they succeeded in cultivating the organisms from the brain (human and experimental animals), cerebrospinal fluid, and naso-pharyngeal washings. The technic employed in each special instance is given, as well as full descriptions of the growth produced, and the control of materials. The organisms developing in fluid cultures appear as minute globular refractile forms (single, diplo-forms, chains and clumps), when viewed under dark field illumination. No true motility has been observed, but the bodies show active Brownian motion. Stained smears show the same morphological forms as noted above, with an average diameter of 0.25 micra of the individual. Young cultures and those grown on fluid medium are mostly Gram-positive, while older cultures and those grown on solid media may be Gram-negative. By prolonged staining the organism stains well in Giemsa, Loeffler's alkaline methylene blue, Unna's alkaline methylene blue (old), or Ljubinsky's pyoktanin-acetic acid, after fixation in methyl or absolute alcohol. The organism is basophilic in its staining reactions. Complete data are given in relation to the culturing of the materials, and animal experimentation with the cultured organism.—L. W. F.

1977. Les inclusions cellulaires de l'encéphalite épidémique. (*Cell Inclusion Bodies in Epidemic Encephalitis.*) C.-I. Urechia. Compt. rend. Soc. de biol., Par., 1921, **85**, 581–583.

In 4 of 10 cases of epidemic encephalitis certain basophilic cell inclusion bodies were found.—G. H. S.

1978. Chronic Meningococcus Septicemia. A Report of Two Cases. Hugh J. Morgan. Johns Hopkins Hosp. Bull., Balt., 1921, **32**, 245–254.

Morgan briefly reviews the literature and gives a clinical classification of meningococcemia, following this by an outline of the case histories, a discussion of the symptomatology of chronic meningococcus septicemia and the treatment of this type of infection, including a short reference to intravenous vaccine therapy.

The two cases reported—one an infection with the normal type, the other with the paranormal type of the meningococcus—yielded to a combination of intravenous and subthecal injections of polyvalent antimeningococcus serum.—F. W. H.

1979. The Value of the Ross-Jones Test on Bloody Spinal Fluid. S. M. Feinberg. J. Lab. & Clin. M., St. Louis, 1921, **6**, 642–644.

Feinberg having observed that the amount of blood in spinal fluid, as determined by the number of red blood cells per cmm., makes a difference in the results of the globulin tests, determined experimentally the amount of blood that must be present in the spinal fluid in order to give a positive globulin test, so that we may be able to tell by counting the number of red blood cells per cmm. whether it could affect this test.

These experiments showed that the amount of blood that must be present in the spinal fluid before a positive globulin test is obtained is the concentration necessary to give in the neighborhood of a little over 300 red blood cells per c. mm.; thus, if traumatic blood is present in a spinal fluid below this necessary limit, a positive Ross-Jones test indicates an undoubtedly pathologic fluid.—F. W. H.

1980. Certain Aspects of Postdiphtheritic Diaphragmatic Paralysis. Harold R. Mixsell and Emanuel Giddings. J. Am. M. Ass., Chicago, 1921, **77**, 590.

In the cases mentioned in the article antitoxin was not given until after the third day. The time of the onset of paralysis was 39½ days. The paralysis lasted for about 36 hours with a fatality of 100 per cent.—P. G. H.

1981. Xanthochromie, hyperalbuminose considérable et coagulation spontanée du liquide céphalorachidien dans un cas de méningite tuberculeuse. Réaction du benjoin colloïdal. (*Xanthochromia, Marked Hyperalbuminosis and Spontaneous Coagulation of the Spinal Fluid in a Case of Tuberculous Meningitis. The Colloidal Benzoin Reaction.*) Creyx and Charles Massias. Compt. rend. Soc. de biol., Par., 1921, **85**, 353–355.

The properties of the cerebrospinal fluid were those indicated in the title. The colloidal benzoin reaction was positive in tubes 1 and 2, sub-positive in tubes 3 and 4, positive in tubes 5 to 8, and negative in tubes 9 to 12. But 38 cases showing the syndrome of Froin have been described.—G. H. S.

DISEASES OF THE RESPIRATORY SYSTEM (EXCEPT INFLUENZA AND TUBERCULOSIS)

(*See also Number 2062*)

1982. An Unrecognized Pathway for Bacterial Invasion of the Respiratory Tract. M. C. Winternitz, G. H. Smith and E. S. Robinson. Proc. Soc. Exper. Biol. & Med., N. Y., 1919–20, 17, 195–196.

Attention is directed to a means of infectious material passing from the region of the larynx or upper trachea to the pulmonary tissue through the lymphatic system. An atrium of invasion for the submucosa may arise from lesions produced in these higher portions of the trachea. The submucosa possesses an abundant lymphatic system, as can be demonstrated by injection of India ink. The plexus extends from the epiglottis downward as far as the bifurcation of the trachea. Similar plexi are found in the submucosa of each of the bronchi,—these connect with that of the trachea above and below with similar systems following the subdivisions of either bronchus. Anastomosing branches connect the plexi with the periarteriolar lymphatics, and other branches pass directly to the regional lymph glands, at the points of bifurcation throughout the cartilage-bearing bronchi. This affords a short circuit around the valves of the deeper pulmonary lymphatics. The direct pathway may be demonstrated by Gram-stained sections prepared from an animal inoculated by injection of virulent pneumococci through the submucosa of the trachea.—L. W. F.

1983. The Treatment of Empyema with Gentian Violet. R. H. Major. Am. J. M. Sc., Phila., 1921, **162**, 397–406.

Major discusses the recent advances made relative to the etiology, pathology and treatment of empyema. In particular, he directs attention to the striking advances made in the therapy of the disease, especially in the treatment of post-influenzal empyema. The delaying of operation, and carrying out first a series of preliminary aspirations is credited with greatly reducing the mortality from the previously shown high death rate. The exact defining of this condition is of importance, since authorities differ as to what actually constitutes an empyema. In the present study "all patients showing a turbid pleural fluid containing microorganisms are classed as empyema." The series reported occurred among prsons who were admitted to the hospital suffering from influenza. A group of these empyema cases was treated by repeated aspirations and intrapleural instillations of gentian violet. A series of 27 cases of post-influenzal empyema received treatment by this method. Fourteen, or 51.8 per cent of the group were cured without operation, and no relapses occurred and no deformities of the chest developed. Prompt symptomatic response followed such injections with rapid diminution or the disappearance of bacteria from the pleural fluid. It was evident that the dye-stuff possessed a very definite bactericidal action. The presence of frank pus was no contraindication to this method of treatment. The method of administering the gentian violet solutions, the strengths in which they are given and frequency, are outlined. Also the effects upon the condition, with full clinical consideration of the various cases are discussed.—L. W. F.

1984. A Review of Ninety-four Necropsies with Special Reference to the Pneumonias. George W. Covey. J. Lab. & Clin. M., St. Louis, 1921, **6**, 611–617.

Covey presents a few points concerning the heart, aorta, kidneys and sinuses and dwells especially on the pneumonias which were encountered on the pathologic service in his centre overseas. This paper is illustrated by photomicrographs of sections from cases of bronchopneumonia, lobar pneumonia and interstitial pneumonia.—F. W. H.

INFLUENZA

1985. Neue Untersuchungen über die Aetiologie der Influenza und der Encephalitis epidemica (lethargica). (Recent Investigations upon the Etiology of Influenza and Encephalitis Epidemica.) Jean Louis Burckhardt. Schweiz. med. Wchnschr., 1921, No. 33, 769–770.

A review of the recent literature on the subject.—G. H. S.

TUBERCULOSIS

(*See also Numbers 1981, 2001, 2022, 2023, 2027, 2028*)

1986. Studies of Humoral Antibodies in Tuberculosis. S. A. Petroff and George G. Ornstein. N. York State J. M., N. Y., 1921, **21**, 299–305.

The authors report studies on agglutination, precipitation and complement fixation in tuberculosis and on changes in blood sugar, urea, creatinin and calcium before and after a systemic reaction in sheep during inoculation. The following facts are brought out in their study:

The protein fraction of the antigen constitutes the strongest antigenic property and the glycerin extract is the best antigen of those used by them. Both antigen and antibodies are colloids and the antibodies are either globulin or adsorbed and carried down by the globulin fraction. Direct sunlight is destructive to the antibodies in a short time but the X-ray and ultraviolet rays have little effect upon them. Also both are amphoteric colloids, are influenced by the H- and OH-ion concentration and may move to the positive or the negative pole; as their electric charge is very small either of these ions may reverse their electric charge. It cannot be proved that fixation of complement may take place without the appearance of a precipitate nor can it be shown that a physical fixation and not an irreversible chemical change occurs in complement fixation. The precipitins and agglutinins are closely related antibodies. When injections are made regularly once a week there is a gradual increase in the blood sugar and urea and a decrease of calcium after each general reaction. When 2 weeks or more elapse between inoculations there is a drop of 50 per cent in the blood sugar.—F. W. H.

1987. La réaction de fixation dans la tuberculose au moyen de l'antigène Besredka. (Complement Fixation in Tuberculosis with Besredka's Antigen.) A. Grumbach. Schweiz. med. Wchnschr., 1921, No. 36, 831–833.

The technic, with a detailed statement of the manner of conducting the preliminary titrations, is given. The results secured are tabulated as follows:

85 cases with *B. tuberculosis* in the sputum
    Fixation positive in 80
    Fixation negative in 5
18 cases with clinical tuberculosis but *B. tuberculosis* not demonstrated
    Fixation positive in 12
    Fixation negative in 6

29 cases without *B. tuberculosis* and doubtful clinically
Fixation positive in 9
Fixation negative in 20
8 cases clinically and bacteriologically without tuberculosis
Fixation positive in 2
Fixation negative in 6

The author considers the fixation reaction with Besredka's antigen as of considerable diagnostic value.—G. H. S.

1988. The Tuberculin Reaction and Anaphylaxis as Studied by the Dale Method. H. ZINSSER. Proc. Soc. Exper. Biol. & Med., N. Y., 1920-21, 18, 123-126.

Studies have been made on tuberculous and experimentally sensitized guinea pigs by the Dale method with a view of determining the relationship, if any, existing between skin sensitiveness and the state of general anaphylaxis. The results, insofar as the investigations have advanced, are summarized as follows:

"Tuberculous animals, unless inoculated with overwhelming doses, always become anaphylactic to tuberculo-protein. Positive uterine reaction is never obtained, however, before the end of the third week, and sometimes not until the sixth week at a time when the disease has made considerable progress.

"Skin reactiveness may develop in such pigs, however, as early as the ninth day, long before the uterus gives any signs of general anaphylaxis.

"There may, thus, exist, in the tuberculous animal marked skin reactivity without any uterine hypersensitiveness.

"Both skin reactiveness and general anaphylactic hypersensitiveness may fade together in the prelethal stages when the pigs are very sick.

"Normal guinea pigs are easily rendered anaphylactic to extracts of tubercle bacilli by injecting them intraperitoneally on successive or alternate days, for ten injections, and testing them on and after the eighteenth day after the last injection.

"Such anaphylactic pigs tested from the time of the last few injections until the time of the fully developed hypersensitiveness have never, except in two instances, given typical skin reactions, and in one of these two the reaction was not as marked as in the typical tuberculous animal, and in the other the possible absence of tubercles could not be excluded.

"Guinea pigs sensitized experimentally with tuberculo-protein, therefore, may be very highly anaphylactic as evidenced by the uterus, and show absolutely no typical skin reaction."

Zinsser describes two types of skin reaction in the animals. One, which appears to be chiefly a vascular reaction with edema, etc., develops within a few minutes or a half hour, and fades within a few hours without subsequent inflammation. The other skin reaction begins gradually, within 3 to 5 hours, reaching its maximum after 24 to 48 hours, and does not fade for 4 or 5 days. It is a distinctly cell-injury reaction, being definitely inflammatory with a little necrosis. The first reaction he considers as probably a true anaphylactic skin reaction; the second perhaps more of a toxic nature, since it does not go hand in hand with general anaphylaxis. A theoretic discussion follows concerning the nature of the substance or substances producing these reactions, and a possible mechanism which may bring about the results.—L. W. F.

1989. The Relative Value of Laboratory and Clincal Methods of Study in the Diagnosis of Tuberculosis. F. M. POTTENGER. Am. J. M. Sc., Phila., 1921, 162, 352-366.

Attention is directed to the rapid developments of medicine during the past three or four decades, especially the laboratory side. The non-laboratory side, while also advancing, has hardly kept pace with the laboratory studies. It is highly important that clinical observations should keep pace with the laboratory research, in particular, relative to tuberculosis. The paper is directed to the analysis of methods of diagnosis as applied to early tuberculosis. The methods of examination most commonly employed for the diagnosis of pulmonary tuberculosis include (1) clinical history; (2) physical examination; (3) examination of sputum; (4) Roentgen rays; (5) tuberculin test, and (6) complement fixation. Under purely laboratory methods the examination of sputum is first discussed. In suspected tuberculosis an examination should be made (1) for tubercle bacilli; (2) for the presence of albumin; (3) for lymphocytes. The presence of tubercle bacilli establishes the diagnosis of tuberculosis, but does not indicate that the disease is active. Old chronic quiescent tuberculosis will often show tubercle bacilli in the sputum without any signs of clinical activity, and such patients may be considered as "bacilli carriers." The absence of bacilli does not necessarily mean the absence of tuberculosis. Often tuberculosis is present in widely scattered areas, at times causing marked clinical symptoms without the tubercles rupturing and the bacilli appearing in the sputum. The ordinary methods of treatment and staining sputum will detect bacilli if present in 2000 to a cubic millimeter. The method of homogenization by treating the sputum with gasoline or xylol and shaking will enable one to detect them if present in numbers of 200 to a cubic millimeter. A single sample of sputum in early tuberculosis lessens the possibility of finding the bacilli to about once out of 10 attempts. Therefore the sputum for examination in suspected early tuberculosis should be collected for 24 hours to 3 days, and homogenized for examination. If the tubercles have not broken down, the data then are of no importance. The sputum should also be examined for albumin, in suspected early cases, as its presence suggests tuberculosis, if such conditions as pulmonary abscess, bronchiectasis, and infected bronchi (post influenzal) can be ruled out. Also the presence of lymphocytes in the sputum beyond 30 per cent points toward a tuberculous lesion. The complement fixation test, which is very irregular in results, may be helpful in conjunction with other data toward a diagnosis. Roentgen rays also are highly important as a laboratory means of diagnosis, but should be operated and interpreted by one who is expert in their use. It must be considered along with other data, as the diagnosis cannot be made by it alone. The tuberculin test has been very helpful to the writer in many cases, but it cannot be depended on alone for a diagnostic measure. Much of the paper is devoted to a discussion of the clinical history and physical examination, with an analysis of the findings, their interpretation, etc.—L. W. F.

1990. Excrecion del Bacilo del Koch por la Bilis. (*Excretion of the Bacillus of Koch in the Bile.*) Alfredo C. Marchisotti. Rev. med. vet., Buenos Aires, 1921, **6**, 6–11.

The author collected at the abattoir the gall bladders of 78 tuberculous cattle, and inoculated guinea pigs with the bile. In 11 cases the guinea pigs developed typical tuberculosis. This did not seem to depend on the grade of tuberculosis in the cattle, as negative results were obtained from animals with generalized tuberculosis and positive results with more or less localized lesions.

The author calls attention to the danger of spreading tubercle bacilli in the feces of such cattle and states that in general the animals were in apparently good condition and the presence of tuberculosis revealed only at autopsy.—F. W. T.

1991. Ortie et tuberculose. (*Nettles and Tuberculosis.*) Maurice Perrin and André Remy. Compt. rend. Soc. de biol., Par., 1921, **85**, 526–527.

The effect of injections of extracts of nettles (*Urtica urens* or *Urtica dioica*) upon the progress of tuberculous infection in guinea pigs was determined. The control animals lived 53–56 days; pigs that received injections both before and after infection lived 63 days; pigs that were injected only after the infection lived 61–75 days.—G. H. S.

1992. Primary Intestinal Tuberculosis. M. Palinsky. Proc. N. York Path. Soc., 1919, **19**, 149–151.

In a study of 6000 consecutive autopsies performed at Bellevue Hospital, it was found that 285 cases showed involvement of some portion of the intestinal tract. Only 5 (1.75 per cent) of the 285 cases failed to reveal pulmonary tuberculosis; of these 5, 2 showed tuberculosis of some other part of the body (one tuberculous peritonitis, the other tuberculous mesenteric lymph nodes), thus leaving only 3, (1 per cent) with involvement of the intestine alone. These results lead the writer to conclude that primary intestinal tuberculosis is an exceedingly rare condition. A table is given showing the anatomical distribution of the tuberculous lesions in the 285 cases of intestinal tuberculosis.—L. W. F.

1993. Zur Frage der Schildkrötentuberkulose. (*The Question of Turtle Tuberculosis.*) Rudolf Machens. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt., Orig., 1921, **86**, 28.

Friedmann's tuberculosis prophylactic and cure produces in the turtle (*Testudo graeca*) a generalized miliary tuberculosis. Similar injections into calf, sheep, goat and guinea pig do not produce tuberculosis.—R. E. B.

DISEASES OF CHILDREN

(*See also Numbers 2055, 2065*)

1994. Studien über das Vorkommen von diphtherieartigen Bacillen in kindlichen Lymphdrüsen. (*Studies on the Presence of Diphtheria-like Bacilli in the Lymph Glands of Children.*) Karl Neubauer. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt., Orig., 1921, **86**, 17–21.

Organisms tinctorially and morphologically resembling the diphtheria bacillus (but Gram-negative) were formed in lymphogranulomata of 2 children. Similar bacteria were found in the lymph nodes of 2 other children showing no lesions. It is concluded that the organism is a benign parasite.—R. E. B.

1995. De l'Auslöschphänomen dans le diagnostic différentiel de la scarlatine. (*Differential Diagnosis of Scarlatina by the "Extinction Phenomenon."*) Henri Reymond. Schweiz. med. Wchnschr., 1921, No. 31, 719–722.

The intracutaneous injection of normal human serum into patients with scarlatina results in the disappearance of the exanthem at the point of inoculation. In some cases the whitened area may extend for a considerable distance about the site of the injection; throughout an area having a diameter of 6 to 8 cm. The reaction is considered specific, since injections made in other exanthematic conditions are not attended with a similar response. It also appears that only human serum will elicit the reaction. The serologic mechanism is ascribed to the normal serum of an "antibody" capable of neutralizing the vaso-dilating property associated with the scarlatinal virus.—G. H. S.

GYNECOLOGY AND OBSTETRICS

1996. Puerperal Mastitis. **Franklin A. Dorman and James K. Mossman.** J. Am. M. Ass., Chicago, 1921, **77**, 509.

The disease is important because an infection of breast parenchyma may cause a termination of lactation. The commonest cause is *Staphylococcus albus*. This germ is frequently present and causes infection when the resistance of the patient is low. Infection occurs by contamination of the nipples and such contamination should be prevented.—P. G. H.

DERMATOLOGY

(*See also Numbers 1974, 2044, 2060, 2064*)

1997. Inoculation of Alastrim or West Indian Smallpox. **J. P. Leake and J. M. Force.** Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 248–249.

An eruptive disease of very low mortality has been observed in tropical and subtropical America for about 20 years. It has been a question whether this disease is identical with smallpox, although the latter disease has been attended with high mortality in previous epidemics in this region. The disease in question has been known as alastrim, varioloid varicella, and kaffir pox. The claim has been made that lower animals were resistant to inoculation with the virus of the disease, while some are susceptible to the true smallpox.

The present study concerns the possibility of inoculating and producing this disease in animals. Pustule contents, preserved in 0.5 per cent of phenol and kept at a low temperature for several months, were obtained from 2 Jamaican cases; also crusts, preserved dry for 2 weeks, were obtained from a case in Haiti. Two *Macacus rhesus* were given cutaneous inoculations with this material. No reaction at the site of inoculation, other than a serous exudate, occurred for 8 days, when an eruption developed at 2 of 3 sites of inoculation on each monkey. No result was had on either of the 2 monkeys with the second of the 2 Jamaican viruses. The typical lesions, consisting of a papule, discrete, 5 to 8 in number in 3 of the sites inoculated, and confluent in the fourth, are fully described. No complete vesiculation appeared. On the eleventh day the lesions were at their height of development. No generalized eruption, nor other symptoms occurred. Cutaneous inoculations with material from one of the monkeys failed to produce results in 3 rabbits—2 of these animals had proved refractory to the original human alastrim material. Thirteen days after the first inoculation with alastrim, one monkey was reinoculated with one of the Jamaican strains which had given a successful result, and the other animal, as well as a control monkey, was vaccinated with an active vaccine virus. The 2 monkeys previously inoculated with alastrim showed at the sites of inoculation no reaction other than that of transient immunity or of trauma, respectively, to the second application of alastrim material, and to the inoculation with vaccine virus. The control monkey developed a typical primary vaccinia. The immunity to vaccinia shown by the test animal was at least as high as that produced by the American strain of smallpox, compared with previous tests on a series of monkeys which had been inoculated with materials from smallpox vesicle and similar tests were done.—L. W. F.

1998. The Etiology of Scarlet Fever. III. The Alkali-Producing Organisms in Scarlet Fever. **R. W. Pryer.** J. Lab. & Clin. M., St. Louis, 1921, **6**, 561–567.

Pryer describes an organism isolated from 8 of 40 cases of scarlet fever, either from the blood, the throat or, more especially, from the tongue. It was best obtained by cultures made on a modified Sabouraud's medium of a pH value of 9.8. Cultures made from 50 controls failed to show the presence of this microorganism.

It is a large coccus-like, spore-bearing, alkali-producing, strictly aerobic organism with an optimum temperature of from 30°to 40°C. and grows on very alkaline media and on those very deficient in meat or meat products. In some respects it resembles members of the yeast family, though no budding forms have been seen.

By inoculation of rabbits an agglutinating serum can be slowly produced. The author has also tested the effect of the serum of convalescents on this organism but the work has not progressed sufficiently to warrant drawing any conclusions.—F. W. H.

1999. Impetigo Contagiosa. Result of Cultures Made of Thirty Cases with Special Reference to the Character of Streptococci Isolated. **D. L. Farley and F. C. Knowles.** Arch. Dermat. & Syphilol., Chicago, 1921, **3**, 753–758.

A review is given of previous reports. Streptococci were found in 24 of 30 cases. Those in which there was an absence of streptococci were of long duration. In 10 instances streptococci alone were found. All the strains except one (*Streptococcus fecalis*) were the hemolytic type which were subdivided into: *Streptococcus pyogenes*, *Streptococcus anginosus* and *Streptococcus subacidus*.

No correlation could be noted between the type of streptococcus found and the resulting clinical lesion.—R. D. H.

2000. Herpes labialis epidemicus. (Epidemic Herpes Labialis.) **Karl Mayer.** Schweiz. med. Wchnschr., 1921, No. 30, 703.

An account is given of an epidemic of herpes labialis in a military unit. Some 30 cases developed within a very short time.—G. H. S.

2001. *Eczéma d'origine tuberculeuse.* (*Eczema of Tuberculous Origin.*) S. MARBAIS. Compt. rend. Soc. de biol., Par., 1921, **85**, 338–339.

In many cases of eczema other evidences of tuberculous infection can be demonstrated, and this fact, taken in conjunction with certain other reactions, indicates that the eczema is of tuberculous origin. In cases of this type positive complement fixation reactions are always secured (with a variety of antigens). The injection of tuberculin into such patients leads to the formation of areas of an acute inflammatory nature simulating in every respect the spontaneously developed lesions of eczema. The very favorable effect of vaccine therapy (several types of *B. tuberculosis* vaccine) also indicates a relation between the eczema and tuberculosis.—G. H. S.

2002. *Ueber die Befunde von Spirochaeten, bei Erythema nodosum* (*Spirocheta agilis*). (*Presence of Spirochetes in Erythema Nodosum* (*Spirocheta agilis*).) RUD. MASSINI. Schweiz. med. Wchnschr., 1921, No. 32, 739–740.

Blood taken from a case of erythema nodosum showed spirochetes in dark-field examination. The organisms were about 4 μ in length, with blunt rounded ends, having no flagella or undulating membrane visible but of very active motility. Stained preparations could not be secured. The name *Spirocheta agilis* is given. The organisms can be found in the blood only during the early stages of the infection.—G. H. S.

2003. *Ueber familiäres Auftreten von Pilzerkrankungen der Haare, Haut und Nägel bei einer aus Polen eingewanderten Familie, verursacht durch Trichophyton violaceum.* (*Familiar Appearance of Fungus Diseases of the Hair, Skin and Nails due to Trichophyton violaceum.*) MORITZ GANZONI. Schweiz. med. Wchschr., 1921, No. 31, 723–725.

Trichophyton violaceum was responsible for mycotic infection in several members of a family.—G. H. S.

OPHTHALMOLOGY

2004. *Ueber die Topographie der parasitären Bindehautkeime.* (*The Topography of Parasitic Organisms of the Conjunctiva.*) KARL LINDNER. Arch. f. Ophth., 1921, **105**, 726.

By means of epithelial scrapings and of excised pieces of conjunctival epithelium, fixed, imbedded, sectioned, and stained, Lindner was able to show that certain types of conjunctivitis are due to true epithelial parasites. Foremost among these is the gonococcus and included in the list are Koch-Weeks bacillus, the pneumococcus, and others. The primary infection occurs on the superficial epithelial cells, where the organisms multiply rapidly in masses. The generated toxins open the way between the individual cells, allowing the organisms to penetrate into the deeper epithelial layers. Here reproduction occurs and eventual toxic cellular death. Some epithelial cells act as true phagocytes and finally force their way to the surface bearing the imprisoned organisms, so that after the first stage of the conjunctivitis is past the only organisms to be found on the surface are dead. Consequently a microscopic diagnosis is possible in many cases only by a study of epithelial scrapings, the secretion failing to show any organisms.

The diplo-bacillus of Morax-Axenfeld on the other hand does not fall into the above classification. It reproduces in the mucous secretion and in the macerated epithelial cells of the lid margin only. Phagocytosis of this organism never occurs.—H. S. G.

2005. *Zur Topographie der Saprophytären Bindehautkeime des menschlichen Auges.* (*The Topography of the Conjunctival Saprophytes of the Human Eye.*) A. PILLAT. Arch. f. Ophth., 1921, **105**, 778.

Lindner's work was amplified by Pillat, who examined some 32 eyes of patients appearing in the clinic because of trouble with the background, but whose conjunctival sacs appeared normal to the naked eye. In these cases he found organisms in the following percentages: *B. xerosis* in 100 per cent; staphylococci in 93.75 per cent; pneumococci in 40.6 per cent; and the diplobacillus of Morax-Axenfeld in 21.0 per cent. In every eye, examination was made of epithelial scrapings from 4 different locations, thus yielding an approximate distribution of the organisms in the normal human conjunctival sac. *B. xerosis* occurred uniformly throughout, as did staphylococci. The pneumococcus was found almost exclusively on the conjunctiva of the eyeball. The Morax-Axenfeld bacillus was irregularly scattered, but appeared in greater profusion on the surface of the conjunctiva of the lids and along the lid margins. In the main, the cellular location of the organisms corresponded to that reported by Lindner.—H. S. G.

OTOLOGY AND NOSE AND THROAT DISEASES

(*See Number 2010*)

ORAL BACTERIOLOGY

(*See also Number 1847*)

2006. *Bacteriology and its Relation to Dentistry.* Guy's Hosp. Gaz., Lond., 1921, **35**, 189–191.

This paper, addressed to dental practitioners, emphasizes the importance of bacteriology to oral diseases, and in particular to dental caries, It is suggested that not only those organisms found in the mouth are responsible for such conditions, but also those in other localities, i.e., intestinal tract, by the elaboration of toxins which reach the general circulation, then lower the vitality of various body tissues, including the teeth. Also as more is learned concerning the etiology of the oral diseases, newer prophylactic and therapeutic means may be found.—L. W. F.

2007. *A Case from Clinical.* M. M. Guy's Hosp. Gaz., Lond., 1921, **35**, 26–27.

The writer reports an interesting case showing a number of pathological conditions causing death which he feels originated from a chronic pyorrhea. The patient had been a sufferer from pyorrhea for many years; the condition had become worse the last 4, and for the past 7 years he had been in failing health—weak and indolent—and a diagnosis of anemia had been made by his doctor. On admission to the hospital he was found to be very anemic and in a generally feeble condition. Among other things the examination revealed a foul pyorrhea affecting the teeth. A week after admission a number of teeth (12 in all) were removed. Cultures from the apex of one grew *Streptococcus longus*, *Staphylococcus aureus*, and *Micrococcus catarrhalis*. Under treatment the blood condition (anemia) was slightly improved. After a considerable period of apyrexia, the patient's temperature suddenly rose to 104.4° on the 29th day after admission, and he fell into an almost comatose condition, had incontinence of urine, dry mouth, parched tongue, edematous uvula, etc. Within a day or two some white membrane appeared on the patient's uvula and fauces. Later he developed otitis media and conjunctivitis (*Staphylococcus aureus*) followed by laryngitis. Eleven days after the onset of the throat condition he developed a temperature of 102.8°, suddenly collapsed, and died from respiratory failure. At autopsy blood was taken from the heart for culture, which grew a hemolytic streptococcus. Among other findings at autopsy were small, fibrous, atrophic suprarenals and thyroid; bone marrow (ribs) pale, fatty; recent pulmonary edema possibly terminal, and slight edema of glottis.

The writer feels that the severe secondary anemia was due to a prolonged absorption of toxin arising from the pyorrhea alveolaris, also the atrophy of thyroid and suprarenals was probably due to the same condition. Further, evidence from the blood picture as well as examination of bone marrow at autopsy indicated a failure on the part of the red marrow. It is suggested that treatment of the teeth condition at its outset might have averted the degenerative changes which followed.—L. W. F.

FILTERABLE VIRUSES

(*See also Number 2032*)

2008. *Studies on Rickettsia prowazeki.* R. Weigl. Przegl. Epidemjolog., Warsaw, 1920, **1**, 1.

It has been found that normal lice may be infected with *Rickettsia prowazeki* by injecting into the intestinal tract, the least trace of leucocytes taken from typhus patients in the pyrexial period, or with the blood of guinea pigs infected with the patient's blood collected during the pyrexial period. The method of producing an artificial infection in lice is given. Infected lice usually die of the infection. The technique of examination for Rickettsia including staining methods is given. The morphological character and in some degree the biological properties of *Rickettsia prowazeki* point to the bacterial nature of this organism. The etiological significance of the *Rickettsia prowazeki* the author had occasion to observe on himself while experimenting with lice in a typhus-free district and having had no contact with typhus cases nor with carriers of infected lice for at least a month. He was accidentally infected with a culture and after 18 days developed a typical case of typhus. The author is not certain of the value of vaccines.—F. W. M.

2009. *Further Studies on Rickettsia Rocha-Lima.* R. Weigl. Przegl. Epidemjolog., Warsaw, 1921, **4**, 373.

Rocha Lima was the first to note the existence of a non-pathogenic *Rickettsia*. In 1919, a non-virulent *Rickettsia* seemingly identical with *Rickettsia prowazeki* was found in lice by several workers on the etiology of typhus fever. Since this time, they have been encountered more commonly in lice, and appear to have spread from Russia throughout Eastern Europe. Morphologically, *Rickettsia Rocha-Lima* shows some slight points of differentiation from *Rickettsia prowazeki*. These are: (a) a variation in form and size, (b) a common arrangement in clumps like staphylococci, and (c) a more intense staining reaction than occurs with *Rickettsia Provazeki*. *Rickettsia Rocha-Lima* remains alive in desiccated feces or salt solution at room temperature for over two months; *Rickettsia prowazeki* under similar conditions perishes within two or three days. *Rickettsia Rocha-Lima* spreads rapidly from louse to louse by contact or by contact with infected material, such as feces; it is avirulent for lice, large intraguttal injections leaving the lice alive and healthy. *Rickettsia prowazeki* is not spread from louse to louse by contact infection, nor by infected feces. It is highly virulent for lice, intraguttal injection of a louse is regularly followed by death within a few hours. The practical differentiation of the two *Rickettsiae* is based upon the virulence test. Material from the gut of a louse showing heavy intracellular infection is injected intraguttally into a few normal lice of laboratory propagation. If they all perish within twenty-four hours, the original infection was by *Rickettsia prowazeki;* if they all remain normal and healthy, it was by *Rickettsia Rocha-Lima.*—W. P. B.

SURGICAL BACTERIOLOGY

2010. *Classification of Streptococcus. III. Streptococci from Normal and Pathogenic Throats, also from Wounds. Classified by Sugar Fermentation, Limiting Hydrogen-Ion Concentration, and Reactions on Milk Mediums.* LLOYD ARNOLD. J. Lab. & Clin. M., St. Louis, 1921, **6**, 312–321.

Arnold found that hemolytic and nonhemolytic streptococci isolated from normal and diseased throats fell into the same group whether classified by Holman's sugar fermentation tests, Avery and Cullen's final hydrogen-ion concentration method or their action on brom-cresol-purple and methylene blue milks.

The author also noted that in many cases of infected wounds, especially about the head and upper extremities, the same strains of streptococci were present in the throat and the wound.—F. W. H.

SEROLOGY

(*See also Numbers 1905, 1964, 1979, 1981, 1986, 1987*)

2011. *Standardization of the Wassermann Reaction.* JOHN A. KOLMER. J. Am. M. Ass., Chicago, 1921, **77**, 776.

The author proposes several modifications as follows: Meeting the requirement of sensitiveness by using a highly sensitive antigen; by using relatively large amounts of antigen; by using relatively large amounts of serum and spinal fluid; by heating serums for only 15 minutes at 55°C.; by using a mixture of guinea pig serum complements prepared in a manner tending to increase sentitiveness to fixation; by mixing serum and antigen for a brief period before addition of complement; by using a primary incubation of from 15 to 18 hours at 6°to 8°C.; by close adjustment of the hemolytic system adjusted to cold primary incubation; by using an antisheep or antiox hemolytic system; by reading the reactions within 3 hours after the conclusion of the secondary incubation.

Meeting the requirement of practical specificity; by adjustment of the hemolytic system to cold primary incubation; by adjustment of the dose of antigen to cold incubation; by using numerous controls.

Meeting the requirements of technical accuracy and uniformity of results: by adoption of the principle that pipetting relatively large amounts of fluid tends to greater accuracy (0.2 to 1.0 cc.); by using a total volume of 3 cc. with sufficient corpuscles and test tubes of suitable size to yield clear, sharp and easily read reactions; using a scale furnishing hemoglobin in solution and nonhemolyzed corpuscles in proper portions.

Meeting the requirement of a quantitative reaction by employing a series of dilutions or doses of serum or spinal fluid.

Meeting the requirement of economy: The new test economizes material but not time.—P. G. H.

2012. *Specific Immunological Reactions of Bence-Jones Proteins.* S. BAYNE-JONES AND D. W. WILSON. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 220–222.

Immunological studies were undertaken to discover, if possible, (1) a difference between various specimens of Bence-Jones proteins, and (2) a difference between Bence-Jones protein and the protein of human blood serum. A specimen of Bence-Jones protein used in these studies came from the urine of a patient and crystallized spontaneously; it was purified by recrystallization. Thirteen preparations of Bence-Jones protein from various sources, prepared in various ways, were submitted to comparative study with human serum by the use of precipitin, complement fixation and anaphylactic reactions.

Precipitin reactions. Solutions of the crystalline Bence-Jones protein, an ammonium-sulphate preparation of a non-crystallizable specimen of this protein from another source, and human serum, were injected intravenously into rabbits. The serum of these animals, after immunization, contained precipitins which flocculated the homologous antigens in high dilutions. The antiserum to the crystalline Bence-Jones protein precipitated the homologous protein in a very high dilution, while it affected only very slightly, or not at all, the other preparations from other sources, and gave no trace of precipitate with human serum. This showed at once that there are differences between various Bence-Jones proteins as regards their precipitability by an anti-serum to one substance of this class, also a sharp immunological distinction exists between Bence-Jones protein and human serum. These findings were corroborated through the use of the anti-serum to the non-crystallizable Bence-Jones protein. The crystalline Bence-Jones protein was not precipitated by the latter serum but variously affected the solutions of the other Bence-Jones protein preparations. It gave a precipitate with human serum (1:1000) solution. Antihuman serum gave precipitates with the urines of several patients with Bence-Jones proteinuria but did not precipitate the solution of the crystalline Bence-Jones protein.

Complement fixation reactions. In these tests, they found that "in general, complement fixation tests, like the precipitin reactions, showed differences between the various preparations of Bence-Jones protein, a cross-reaction between human serum and the salted-out specimens of non-crystallizable Bence-Jones protein, and a complete difference between the crystalline Bence-Jones protein and blood serum."

Anaphylactic reactions. An antigenic difference was indicated by the difficulty experienced in sensitizing guinea pigs to crystalline Bence-Jones protein, while the other preparation of the protein readily brought this about. Tests for specific sensitivity were made in two ways, 3 weeks after the first injection of the protein or human serum in the animal for active sensitization: the method of Schultz and Dale with the uterine horns of the guinea pigs, and by intravenous or intraperitoneal injections of the various antigens. Some animals were passively sensitized by the intraperitoneal injection of the anti-serum to the crystalline preparation. The results of "these reactions also demonstrated (1) differences between the various Bence-Jones proteins, (2) a mixture of human serum proteins and Bence-Jones proteins in the preparation made in the attempt to salt-out Bence-Jones protein from the urine, and (3) complete difference between the crystalline Bence-Jones protein and human serum."

The writers briefly outline the technique employed in the tests and also submit some of the data.—L. W. F.

2013. A Study of the Serum of Complement-deficient Guinea Pigs. A. F. Coca. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 71.

A race of guinea pigs naturally deficient in complement has been described by Moore. The sera of 4 of these animals were separately examined by Coca, as to the presence of the complement components. It was found in each instance that both the "mid-piece" and the "end-piece" of complement were present. But the thermostabile element, the so-called "third-piece," was lacking. The latter component is destroyed by cobra venom, and absorbed by yeast cells and bacteria. In quantities 40 times greater than the minimal completely hemolytic quantity of normal serum this complement-deficient guinea pig serum failed to produce hemolysis. If a small quantity of inactivated normal serum (guinea pig or human) was mixed with the complement-deficient serum, it hemolyzed in quantities about 3 times that of normal guinea pig serum. The blood of the complement-deficient guinea pigs clots normally, indicating that the "third-piece" of complement is not identical with the lipoid cytozyme (thrombokinase). Six volumes of ether fails to absorb the "third-piece" of complement out of normal serum.—L. W. F.

2014. The Wassermann Test and Its Interpretation. R. L. Kahn. J. Lab. & Clin. M., St. Louis, 1921, **6**, 579–593.

Kahn discusses the requirements of the laboratory for correct tests, the responsibility of the physician in ensuring these and the interpretation of the results.—F. W. H.

2015. The Rate of Fixation of Complement at Various Temperatures. R. L. Kahn. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 168–170.

In a preliminary report upon the rate of complement fixation at various temperatures, Kahn submits an outline of his investigations with data from the experiments, when purified proteins were used as antigens. Four rabbits were immunized with these substances, 2 with edestin (from hempseed) and 2 with phaseolin (from kidney bean). Those animals immunized with edestin received it intravenously by a method described elsewhere; the other series received intraperitoneal injections of phaseolin. One animal received 100, 150, 200, 250, and 300 mgm. of phaseolin at 48-hour intervals; the other 100, 150, and 200 mgm. at 24-hour intervals. The complement-fixation tests were made in one-tenth quantities of the regular Wassermann technic; otherwise in the usual manner, with 2 units of complement, 2 units of amboceptor, and 0.1 cc. of a standard 5 per cent suspension of sheep blood corpuscles. Ten mgm. of the antigen (in each case) were dissolved in an alkaline solution consisting of 10 cc. of N/1000 NaOH to which was added 0.05 cc. of N/10 NaOH. One cc. of the protein solution was added to 9 cc. of saline solution, and 0.1 cc. of this final solution (0.01 mgm. protein) was used in the tests. The following serum solutions were used in the tests: 0.01 cc., 0.007 cc.; 0.004 cc., 0.003 cc.; 0.002 cc.; 0.001 cc.; 0.0005 cc.; 0.0003 cc.; and 0.0001 cc. Preliminary tests were used to demonstrate specific complement-fixing substances in the animal's sera. Then experiments were carried out as outlined above, varying both the lengths of time and the temperature of fixation. Three different fixation temperatures were employed—water-bath, room and ice-box. In the first series of tests run at both water-bath and ice-box temperatures, the following fixation periods were tested: 15, 30, 45, 60, 90, and 120 minutes. Since complement has a tendency to be destroyed at incubator temperature, the tests were not extended beyond 2 hours; also the same time period was used at room temperature. Standard amounts of sheep cells and amboceptor were added to each set at the end of the fixation period, then placed in the water-bath to demonstrate whether or not the complement had been fixed. The writer submits the following conclusion:

"(1) That the phenomenon of fixation of complement goes on equally well at water-bath, room, or ice-box temperature.

"(2) That from 50 to 75 per cent of fixation takes place during the first hour and that fixation is completed in the neighborhood of 4 hours at ice-box temperature."—L. W. F.

2016. The Quantitative Relation between Complement and Complement Fixing Antibody. R. L. Kahn. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 170–171.

Kahn, in a study on precipitin and complement-fixing antibodies, produced by injections of edestin, found that the serum of the immunized rabbit showed precipitin antibodies, but no complement-fixing antibodies when employing the usual 2 units of complement in the fixation tests. Suspecting that such antibodies might be present in the serum, perhaps the amount of complement used was too great to demonstrate fixation. Tests were made using complement gradations of 1¼, 1½, 1¾ and 2 units against 0.01 cc. of the serum. The serum, which had given negative results with 2 units of complement, gave weak positive reaction with 1¾ units; stronger positive results with 1½, and still stronger positive with 1¼ units of complement. It is pointed out that the employment of 2 units of complement in the complement-fixation test which he used is too great in amount for correct results in some cases.—L. W. F.

2017. *The Thermostability of Complement Fixing Antibodies Resulting from Protein Immunization.* R. L. Kahn. Proc. Soc. Exper. Biol., & Med., N. Y., 1920–21, **18**, 171–172.

Kahn and Boyd had previously shown that the complement-fixing substances of syphilitic serum were destroyed in practically all cases at a temperature ranging from 60° to 65°C. In the present paper is considered the question whether the same observation holds for specific complement-fixing antibodies as occurs in syphilitic sera containing a non-specific substance. Series of tests were made, using serum of animals immunized against purified vegetable proteins, as outlined in a previous paper. The first tests were the unheated immune serum, and the same serum heated to varying temperatures, beginning with 5 minutes at 56°C., and ending with 1 hour at 65°C. It was found that these temperatures did not lessen the antibody content of the rabbit serum, so other tests were made at higher temperatures. Sera diluted 1:10 with saline to raise the protein coagulation level (Eberson) were heated in the water bath for 2 hours at 65°C., 1 hour at 70°C. and one-half hour at 75°C. Tests failed to show any destruction of antibody content. These sera were heated at 80°C., and at 85°C. for 15 minutes, with the result that practically all the antibodies were destroyed at the former temperature, and entirely so at the latter It is suggested that there exist inherent biological differences between the complement-fixing bodies in syphilitic serum and the specific complement-fixing antibodies in such sera as are studied above.—L. W. F.

2018. *Further Studies on the Affinity of Sheep-Corpuscles for Anti-sheep Hemolysin.* R. L. Kahn and D. S. Lyon. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 291–293.

A quantitative study of the hemolysin absorption capacity of 0.05 cc. packed sheep blood cells when added to a series of test tubes containing a constant volume (1.0 cc.) of saline with different concentrations of the specific hemolysin is reported. The mixtures were allowed to stand at room temperature for 10 minutes; then the cells were thrown down by rapid centrifugalization; then the number of unabsorbed units of hemolysin remaining in the supernatant fluid was determined by a test which is outlined. The results from one series of experiments were as follows:

Table showing the effect of the concentration of hemolysin on the absorption capacity of 0.05 cc. of packed sheep cells.

TUBE NUMBER	NUMBER OF UNITS PER CUBIC CENTIMETER		NUMBER OF UNITS IN SUPERNATANT FLUID	NUMBER OF UNITS EXTRACTED
1	14,300	0.05 cc. packed sheep cells added to each tube and extraction permitted for 10 minutes at room temperature, followed by rapid centrifugation	5,550	8,750
2	10,725		2,500	8,225
3	7,150		1,250	5,900
4	3,575		199	3,376
5	2,860		150	2,710
6	2,145		67	2,078
7	1,430		33	1,397
8	715		10	705
9	357		1	356
10	178		0	178

Further studies were made to determine the stability of the sheep cell-hemolysin union. It was found that little difference existed between the quantity of hemolysin absorbed after 10 minutes' extraction at room temperature, and that absorbed after 1 hour extraction in the water bath. Less extraction was observed in a few cases, where the mixture was placed in the water bath for one hour, than that at room temperature for 10 minutes. They explain this as being due to dissociation of cells and hemolysin after prolonged exposure at warm temperature, and to hemolysis of a small number of corpuscles due to agitation, permitting the absorbed hemolysin to be freed.—L. W. F.

2019. *The Effect of Heat on Specific Complement Fixing Antibodies.* R. L. Kahn and S. R. Johnson. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 293–294.

In previous studies it was found that specific complement-fixing antibodies resulting from protein immunization were comparatively thermostabile, while those so-called complement-fixing antibodies present in syphilitic sera were thermolabile. Similar studies have been made on the complement fixing antibodies resulting from bacterial immunization. The following anti-sera were used in the tests: (1) antityphoid (rabbit) serum, (2) anti-abortion (ox) serum, and (3) antimallei (rabbit) serum. Bacillary suspensions of the specific organisms titrated in accordance with standard technic were used as antigens. Immune serum, in each case, was subjected to different temperatures up to 85°C. for varying periods, and along with the same unheated serum, was given the complement fixation tests. When the sera were heated for 1 hour in the water bath at 65°C., the antibodies remained intact, while syphilitic serum fixing bodies are destroyed at this temperature. Varying degrees of antibody destruction, depending particularly on the time of exposure, result from heating at higher temperatures. Between 20 and 60 per cent of the antibody content was destroyed in one hour at 70°C.; between 80 and 90 per cent destruction occurred in one-half hour at 75°C., while complete destruction of the antibodies took place in 15 minutes at 80°C.—L. W. F.

2020. *On the Persistence of Complement Fixing Antibodies in the Serum of Rabbits Immunized with Purified Proteins.* R. L. KAHN. Proc. Soc. Exper. Biol. & Med., N.Y., 1920–21, 18, 294–295.

Two rabbits were immunized with purified proteins; one received intravenously a total of 0.5 gm. of edestin in divided doses (50, 75, 100, 125 and 150 mg.), spaced over 8 days; the other received intraperitoneally a total of 1.0 gm. of phaseolin also in divided doses (100, 150, 200, 250 and 300 mg.) spaced over an 8-day period. The first animal had its initial injection on November 15, 1920; the second, on December 28, 1920. The serum of each was tested from time to time for the presence of specific complement-fixing antibodies. The serums of both animals were given a final examination on May 5, 1921. The antibody content of each had declined, still sufficient numbers were present to merit the designation of 3 plus (+++) with the usual complement fixation technic. The final result in the first animal, which received only 0.5 gm. of protein 5 months before, was of especial interest. As it is quite unlikely that any of the small quantity of protein was still present in the animal's body after such a long period of time, the demonstration of specific complement-fixing bodies offers data of value concerning the question of the nature of such antibodies.—L. W. F.

2021. *A Study of the Wassermann Reaction in One Hundred and Forty Cases of Diabetes Mellitus.* J. ROSENBLOOM. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, 18, 236.

A positive Wassermann reaction was found only 16 times in a group of 140 cases of diabetes mellitus. Eight of the positive cases presented signs of tertiary syphilis, and were treated for that condition. No increase in carbohydrate tolerance followed the treatment, which might be due to the fact that the fibrosis of the pancreas produced by the syphilis is not changed by the treatment.—L. W. F.

2022. *The Purification and Concentration of Antigens by New Methods of Adsorption.* A. B. WADSWORTH AND F. MALTANER. Proc. Soc. Exper. Biol. & Med., N. Y., 1919–20, 17, 189–190.

In the past it has been difficult to prepare a satisfactory antigen to be used in the complement fixation test in tuberculosis. The writers made a study of this particular problem, and offer a new method for the preparation of complement-fixing antigens. Their investigations were carried out by using 3 strains of tubercle bacilli: one a virulent, another a non-virulent human strain, and a third a bovine strain. The immune serum for titration purposes was obtained from inoculated horses.

Various methods of fractioning and extraction, as used by other observers, were employed in preparing the antigens from cultures. The glycerine and distilled water extracts gave the most active antigens. The culture filtrates were so anticomplementary that they could seldom be used. The adsorption studies were carried out on the active antigens, and also the culture filtrates. To adsorb the substances possessing antigenic properties from the filtrates animal charcoal and globulin (horse serum) were employed. The animal charcoal removed the antigenic substances, but they could not be removed by extraction. The globulin method gave quite satisfactory results, although a more complicated procedure. The technic is given as follows: "The original antigen was dialysed and horse serum, one part to twenty of antigen, was added and allowed to stand in the incubator half an hour. The globulin was then precipitated by passing purified CO_2 gas free from HCl through the mixture for one half hour at 37°C. The globulin precipitate was collected and by shaking it with alcohol the antigenic substances were extracted. The alcoholic extract was concentrated in a vacuum."

Practically all the anticomplementary substances were eliminated from the culture filtrate by preliminary dialysis. The antigenic substances were removed from the culture filtrates and aqueous extracts by the adsorption with globulin. By this method the antigens were easily obtained in a greatly purified and concentrated form.

It was found, in preliminary studies, that the antigen used for the complement-fixation test in syphilis also could be purified and concentrated by similar methods.—L. W. F.

2023. *Concerning the Specificity of Cholesterinized Antigen in the Serologic Diagnosis of Syphilis.* R. A. KILDUFFE. Arch. Dermat. & Syphilol., 1921, 3, 598–607.

The incidence of positive serums with a cholesterin antigen in a series of 1,000 Wassermann tests was found to be 31 plus 4 reactions, 3 plus 3, 2 plus 2 and 8 plus 1.

The use of at least 2 other antigens is advocated in conjunction with the cholesterin. The presence of reactions below 3 plus with cholesterin antigen is considered suspicious and indicative of the need for further investigation before it can safely be termed a false fixation.—R. D. H.

2024. *A Standard Method for Preparing and Standardizing Lipoidal Antigens for the Wassermann Test.* L. J. Hadjopoulos. J. Lab. & Clin. M., St. Louis, 1921, **6**, 624–635.

Hadjopoulos states in this paper: The study of the nature of lipoidal antigens has attracted much attention since the time when the complement-fixation test was adapted to the diagnosis of syphilis. Much time has been spent in discovering new methods of producing more potent or sensitive antigens but little in trying to establish a strictly scientific method for standardization of the complement-fixing value of the antigen. Attempts at standardization by determining the amount of solids present in a definite volume of a given antigen have been made. The fact that there is no fixed ratio between the lipin and non-lipin fractions renders such a method unsatisfactory. Even in the case where the non-lipin fraction is removed by precipitation and the lipins weighed error creeps in because the acetone-insoluble portion of tissue extractives does not represent their total antigenic value.

The author's method of standardization is an attempt to handle the question of antigens in mathematical terms, his antigenic unit being the least amount causing complete fixation of one unit of complement in the presence of exactly one unit of specific reagen. It is absolutely essential to fix the unit specific value of the serum against which the antigen is to be titrated since no two four-plus serums necessarily contain the same amount of specific reagen. His technique includes (1) the determination of the minimal fixing value in the presence of a known strong positive serum, (2) the determination of the approximate standard unit of antigen and (3) the determination of the exact antigenic and specific units. He also determined the non-specific and hemolytic values of the antigen. Hadjopoulos studied a number of antigens collected from different laboratories in New York according to this scheme and computed the ratio of the specific and non-specific antigenic units. This ratio he calls the Specific Coefficient. These antigens grouped according to the specific coefficient were divisible into 5 classes, the specific coefficients ranging from 1 to $\frac{1}{20}$. The specific coefficient gives the relative, not the absolute, specific value of an antigen.

The author also found the amount of solids contained in a definite volume of antigen, excluding cholesterin and alcohol-soluble proteins, bears a direct ratio to the degree of specificity of the antigen. Because of this relationship and because the highest yield in solids is obtained by keeping the strength of the alcohol as high as possible the author has devised a technique for extracting the dried heart muscle and dried tissue juices. This antigen is rich in extractives of complex chemical composition, being in the main various aminophosphatids. Besides these it contains fats, fatty acids (especially stearic) and a faint trace of cholesterin and soluble proteins. As it ages soaps are formed by combination of the fats and fatty acids with the alkaline elements in the extract, these soaps precipitating and carrying down a part of the fats caught among the granules of soap.

From a series of comparative tests on approximately a thousand serums taken at random the author found the antigens prepared and standardized by his method are preferable to cholesterinized antigens and are less liable to give misleading results.—F. W. H.

2025. *Ein Beitrag zur Darstellung und zur Kenntnis der Wildbolz'schen Antigene.* (*Contribution to the Knowledge of the Wildbolz Antigen and its Preparation.*) J. von Bergen. Schweiz. med. Wchnschr., 1921, No. 28, 655–657.

Simplified and improved methods for the preparation of the Wildbolz antigen are described.—G. H. S.

2026. *Cholesterol and Cholesterol Esters in Blood Showing a Positive Wassermann Reaction.* A. Knudson, T. Ordway and H. Ferguson. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 299–301.

Cholesterol and cholesterol esters were determined on the whole blood of a series of patients having various forms of syphilis and showing strongly positive Wassermann reactions. The cases were grouped into syphilis (a) of the heart and blood vessels, (b) central nervous system, (c) with skin manifestations, and (d) some showing no physical signs. Control cases with negative Wassermann reactions were studied. The methods of Bloor, and of Bloor and Knudson, were used for the cholesterol and cholesterol ester determinations. It was found that the total cholesterol content is not affected, but the amount of cholesterol as esters is considerably decreased in the various syphilitic conditions. The average percentage for normal patients with negative Wassermann reactions is 34.4, while in those cases showing positive Wassermann reaction and distinct physical signs the average was about 21 to 22. per cent. Three cases with a positive Wassermann reaction, but no physical signs of the disease, did not show a marked reduction of the cholesterol esters. A series of determinations on the blood, before and after experimental inoculation with *Spirocheta pallida* (blood showed four plus Wassermann reaction), gave results in close agreement with the determinations on the human cases. In no other disease, so far reported in the literature, is there this balance between free cholesterol and its esters (bound cholesterol). It is possible that this altered relationship of cholesterol and its esters has some bearing on the nature of the Wassermann reaction.—L. W. F.

2027. *Le séro-diagnostic de la tuberculose au moyen de l'antigene de Besredka par la procédé du sérum non chauffé.* (*Sero-diagnosis of Tuberculosis with Besredka's Antigen and Unheated Serum.*) Charles Massias. Compt. rend. Soc. de biol., Par., 1921, **85**, 356–357.

Complement fixation reactions were performed upon the blood or spinal fluid of 140 individuals, employing unheated serum and the antigen of Besredka. The hemolytic index of the serum is determined 24 hours after bleeding and is employed in 1 cc. amounts with 3 quantities of the antigen (0.1, 0.2 and 0.3 cc.). After incubation for 1 hour at 37°C. 5 per cent sheep cells are added in amounts determined by the index and the results are read after a 30-minute incubation period. When spinal fluid is used the appropriate quantity is 0.8cc. With this procedure, applied to 40 cases of progressive tuberculosis, 40 positive fixations were secured (4 were weak fixations). In 3 of these cases the Wassermann was also positive. In 21 cases of healed, latent, or fibrous tuberculosis the technic gave 17 positive and 4 negative reactions. (All Wassermann's were negative.) Seven cases of glandular tuberculosis were tested; of these but 1 case was suppurative, giving a positive test, 6 were non-suppurative and 3 gave positive fixations. The reaction was positive in 1 case of hepatic tuberculosis, and of 7 cases of bone tuberculosis 3 gave positive fixations (of these the Wassermann was slightly positive in 2 cases). In tuberculous meningitis (4 cases) the blood gave positive fixations in 3 cases, negative in 1. Negative reactions were secured with a large number of different pathological conditions not complicated by tuberculosis.—G. H. S.

2028. Comparison des séro-réactions d'agglutination et de déviation du complément dans la tuberculose pulmonaire. (*Comparison of the Agglutination and Complement Fixation Reactions in Pulmonary Tuberculosis.*) Paul Courmont. Compt. rend. Soc. de biol., Par., 1921, **85**, 457–459.

The agglutination reactions, the complement fixation reaction and the cutaneous tuberculin test were compared in a series of 50 cases of progressive pulmonary tuberculosis. The agglutination reaction was positive in 32 (64 per cent). The cutaneous test was applied in 33 cases and was positive in 17. In 12 patients the fixation was positive, the agglutination negative. In 3 the fixation was negative and the agglutination positive. In 6 cases both the agglutination and fixation reactions were negative. In 5 cases of pleurisy of tuberculous origin the pleural fluid gave fixation in 3 cases while serum agglutination was positive but once. The 3 reactions—agglutination, fixation, and tuberculin—are of diagnostic as well as prognostic value. Fixation is more frequently obtained in severe cases than is agglutination.—G. H. S.

2029. Studies on the Resistance of Red Blood Cells. III. The Relation of Cholesterol to the Resistance of the Red Blood Cells to the Hemolytic Action of Sapotoxin. Chas. H. Nielson and Homer Wheelon. J. Lab. & Clin. M., St. Louis, 1921, **6**, 568–578.

Their results are summarized as follows:

"The red cells may be considered as composed of jellies which exist and depend upon their content and peculiar behavior of lipins. The cholesterol both of the cell itself and about the cell acts as an antihemolytic while lecithin tends to combine with toxins to form lecithides. Such formations react upon the cell to destroy its composition, thereby liberating the hemoglobin from the stroma. Diseases in which the cholesterol content is high show an increased red cell resistance to sapotoxin solutions; those showing a low cholesterol content also show a lessened degree of resistance to specific hemolytic agents. Hence it may be concluded that the cholesterol of the blood in great part determines the degree of resistance of the red cells to sapotoxin solutions."—F. W. H.

2030. L'action exercée sur l'hémolyse par différents sels métalliques. (*Influence of Different Metallic Salts upon Hemolysis.*) Helen A. Purdy and L.-E. Walbum. Compt. rend. Soc. de biol., Par., 1921, **85**, 374–376.

The effect of salts of the metals upon the hemolytic reaction was determined employing the systems goat-staphylolysin; horse-saponin; and sheep-complement-amboceptor. The results showed: .

Goat cell-staphylolysin system

activating	inhibiting
←	→
Au-Hg-Co-Ag-Mn-Pt-Ni-Mg-Cd-Li	Sr-Ba-Ca-Zn-Pb-Cu-Al-Be-Cr-Fe

Horse cell-saponine system

activating	inhibiting
←	→
Au-Hg-Ag-Pb-Co-Mn-Ba-Mg-Ca-Sr	Cd-Ni-Zn-Al-Cu-Fe-Cr

Sheep cell-complement-amboceptor system

activating	inhibiting
←	→
Ni-Co-Hg*-Mg*-Ag*-Li	Mg*-Ca-Sr-Ba-Cd-Ag*-Be-Cr-Hg*-Ph-Al-Fe-Cu-Zn-Mn-Pt-Au

* Certain of the salts activate, others inhibit the hemolysis.

—G. H. S.

2031. Precipitin Response in the Blood of Rabbits following Subarachnoid Injections of Horse Serum. H. L. Alexander. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 9–11.

Manifestations of anaphylactic signs and symptoms have been observed in patients receiving therapeutic serum intravenously several days subsequent to intraspinous treatments with antimeningococcic serum in meningitis cases. The time of the last intraspinous injection did not influence the reaction, appearently it depended upon the time period between the initial intraspinous and the initial intravenous injections. When combined intravenous and intraspinous therapy was applied from the outset the reaction was not noted.

An experimental study of the above phenomena was undertaken by injecting rabbits intraspinously with horse serum, and comparing the resulting precipitin formation in the blood, with that induced by similar intravenous injections. Anaphylactins were studied in a few instances. The technic of the intraspinous injections of the normal horse serum (without preservatives) into the animals, as well as that for the test, is outlined by the writers. Parallel intravenous injections in rabbits with identical amounts of the same serum, and the bleedings and precipitin tests of each, were done at the same time. Normal rabbit serum and normal sheep serum were used as controls in tests. The authors summarize the results of their investigations, as follows:

"(1) Rabbits receiving a single dose (0.5 cc.) of normal horse serum into the subarachnoid space, produce precipitins in the blood in greater abundance, of higher titer, and which persist longer than those in control rabbits receiving a similar injection intravenously.

"(2) Repeated subarachnoid injections (0.5 cc.) of normal horse serum in rabbits induce precipitins in the blood early. These may appear in high titer as soon as one week after the initial injection, whereas in rabbits similarly treated intravenously no precipitins were found at this time. They may appear a few days thereafter and reach a high titer.

"(3) No anaphylactic manifestations occurred in rabbits treated repeatedly with subarachnoid injections of normal horse serum when the precipitin content of the blood was high.

"(4) Anaphylactins, as determined by passive transfer of anaphylaxis, were demonstrated in sera with high precipitin content.

"(5) These experiments may explain clinical manifestations of intolerance to horse serum, observed when an initial intravenous injection of antimeninogcoccic serum followed a series of intraspinous injections of such serum."—L. W. F.

2032. On the Interrelation between the Widal and Weil-Felix Tests. H. Weyland and F. Venulet. Przegl. Epidemjolog., 1920, **1**, 38.

Tht authors conclude that: 1. The serological behavior of several breeds of rabbits immunized with *B. typhosus* and *B.* X 19 corresponds to the behavior of positive patients' sera. (Positive Widal and Weil-Felix; 2. a positive Widal test in typhus patients may be either specific i.e. following typhoid infection or vaccination, or it may be nonspecific, being due to the property of polyagglutination exhibited by typhus sera; 3. sera of rabbits immunized with *B.* X 19 do not give unspecific tests with *B. typhosus;* 4. the differentiation of the agglutinins by means of the Castellani test is of great practical importance while at the same time it helps to disentangle the interrelation of the two tests; 5. Weil-Felix and Widal tests if both positive should be repeated in the course of the disease to differentiate one from the other.—F. W. M.

2033. Untersuchungen über den Agglutinationstiter nach Typhusschutzimpfung bei Gesunden und Kranken. (Studies on the Agglutination Titer after Typhoid Vaccination in the Healthy and Sick.) W. Lahm. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt., Orig., 1921, **86**, 21–27.

Revaccination against typhoid reestablishes promptly the agglutination titer reached after the first inoculation. Typhoid infection (infectious intestinal catarrh) has the same effect upon agglutination titer of the blood of those vaccinated as does a revaccination. Not only typhoid, but various dysentery-like colitides and even the Flexner dysentery may cause increases in the typhoid agglutinin titer of the blood.—R. E. B.

2034. The Isoagglutinins and Isohemolysins of the Rat. G. L. Rohdenburg. Proc. Soc. Exper. Biol. & Med., N. Y., 1919–20, **17**, 82.

Irregularities in immunity against transplanted tumors were observed in groups of rats derived from 3 different sources. These groups showed rather marked external differences. One group, pure white in color, showed a very high percentage of natural immunity against the growth of the Jensen rat sarcoma; a second group, red and white in color, showed resistance to the growth of the Flexner-Jobling rat carcinoma; the last group, hooded black and white, was equally susceptible to both tumors. The possibility that the presence of isoagglutinins or isohemolysins in the hosts might occur and be a factor in the reaction against the implanted tumor, led the writer to search for these bodies in 50 animals. The test was made by mixing 9 drops of serum and 1 drop of a 5 per cent suspension of washed red blood cells in a test tube. Five series, consisting of 10 animals, 3 each from 2 of the groups, and 4 from the remaining group, were tested. In each series the serum of each animal was tested against the serum of every other. It was found that neither agglutinins nor hemolysins were demonstrable by the test between animals of the same strain, or between animals of different strains.—L. W. F.

2035. The Agglutinating Action of Salvarsan in Vitro and in Vivo. J. Oliver and S. Yamada. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 313–314.

The mechanism of the agglutinating action of salvarsan on red blood cells was studied. It was found that the drug possessed a fairly constant titer *in vitro*, which progressively dropped as oxidation occurred in the solution. No agglutination of the blood cells takes place in isotonic sugar solutions, although the cells have the power to bind the salvarsan. If a certain amount of salt is added, then agglutination occurs. Under certain conditions serum, as well as other hydrophilic colloids, inhibits aggultination, since they prevent the union of salvarsan with the cells. Intravascular agglutination follows intravenous injection of large doses of salvarsan in rabbits, which may be observed in the drawn blood. The animals which die acutely show petechial hemorrhages in the lungs, caused by emboli of the agglutinated red cells. Animals injected at 3-day intervals with sublethal doses of the drug occasionally die during the third or fourth injection. These animals also show the evidences of intravascular agglutination, and pulmonary embolism. Some additional factors are supposed to enter in this last reaction, as the sum total of the repeated doses barely reaches the concentration necessary for immediate intravascular agglutination, and this sum must be considerably reduced by excretion of the drug during the 6 to 9 days intervening. A distinct drop in the inhibiting power (some cases one-sixteenth of the original value) of the serum on the agglutination, *in vitro*, of red blood cells by salvarsan, occurred during the course of the injections, but the red blood cells themselves showed no increase in agglutinability.—L. W. F.

2036. *On the Precipitins in Bloodsera of Arthropods.* LEO LOEB. J. Med. Research, Bost., 1921, **42**, 269–275.

Limulus serum mixed with the serum of the spidercrab, rockcrab, bluecrab or lobster produces a precipitate provided the proportions used are suitable.—A. C. E.

2037. *A Simpler Way of Preparing Colloidal Gold Solution.* M. LEDERER. Proc. N. York Path Soc., 1920, **20**, 87–90.

A procedure is reported for the preparation of colloidal gold solution for the detection of reducing substances in the cerebrospinal fluid, which gives practically uniform solutions after almost every attempt. Also satisfactory diagnostic curves result from its application to clinical cases. The writer publishes curves showing the reaction in syphilitic conditions in the report. In the preparation of the solution, the cleanliness of the glassware was found to be of great importance; it is soaked in freshly prepared aqua regia (U. S. Dispensatory Formula) for 3 days, then thoroughly rinsed with distilled water until no change in color is produced on blue litmus paper. The distilled water is made from an ordinary laboratory still, and is not redistilled. The solution is prepared as follows:

Accurately measure 500 cc. distilled water; place it in a liter Erlenmeyer flask, to which add 5 cc. of a 1 per cent solution of chloride of gold (Merck and Co.), 3.5 cc. of 2 per cent solution potassium carbonate, 0.87 cc. of 1 per cent solution oxalic acid, and 0.2 cc. of a 2.5 per cent solution of formalin. Place the mixture on a square of asbestos board, over a flame, and gently heat until swirls of water begin to rise to the surface. Do not permit bubbling to occur. Adjust flame so that the temperature of the solution remains at the point indicated, and heat for 40 to 45 minutes. The solution should become dark after this time. When the color change occurs, add more formalin solution, drop by drop, while gently agitating the fluid by a rotary motion. A brownish red discoloration is soon observed in the wake of each drop, and the solution becomes darker and darker, changing to a reddish color, then suddenly it changes to the typical old rose hue. Remove the flask from the flame and allow it to cool. The amount of formalin required for some unknown reason is variable even when several lots of solution are being prepared at the same time—usually about 1.7 to 2.2 cc. are necessary.—L. W. F.

2038. *Note sur la réaction du benjoin colloïdal dans la syphilis et l'hérédo-syphilis nerveuses non évolutives.* (*The Colloidal Benzoin Reaction in Syphilis and in Latent Congenital Syphilis of the Nervous System.*) RENÉ TARGOWLA. Compt. rend. Soc. de biol., Par., 1921, **85**, 336–337.

Five cases are reported in which the Wassermann reactions were negative and the colloidal benzoin reactions positive. This combination of serologic reactions is rarely encountered in cases of progressive syphilitic infection or in general paralysis but appears to be the rule in cases of latent congenital syphilis of the nervous system. In such cases the benzoin reaction is obviously more sensitive than the Wassermann reaction.—G. H. S.

2039. *Sur la réaction de précipitation du benjoin colloïdal avec les liquides céphalorachidiens pathologiques.* (*Colloidal Benzoin Reaction in Pathological Cerebrospinal Fluids.*) E. WEILL, A. DUFOURT AND X. CHAHOVITCH. Compt. rend. Soc. de biol., Par., 1921, **85**, 475–476.

The colloidal benzoin reaction was employed in testing the spinal fluids of infants and children. In 9 cases of tuberculous meningitis the meningeal type of reaction was secured in 3 cases, the syphilitic type in 6 cases. A meningitic reaction was presented by a cases of cranial trauma, although no tuberculosis could be demonstrated. Other reactions were secured which failed to conform to the clinical conditions, from which it is concluded that in infants and children the reaction lacks a constant differential value.—G. H. S.

SERUM THERAPY

(*See also Number 1858*)

2040. *Antipneumococcus Protection Substances in Normal Chicken Serum.* C. G. BULL AND C. MCKEE. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 174–175.

Mice and guinea pigs are protected against infection with the pneumococcus by mean of normal chicken serum. It was found that the serum protects against all serological type of pneumococci. A particular protective substance for each type is present, and any one may be removed from the serum by absorption with the particular type of organism without removing the protective substances for the remaining types. If serum is absorbed with Type I organisms, it no longer protects aginst this type, but still protects against Type II cultures as before the absorption, and vice versa. Between all of the types this relation exists. It was found that a peculiar relationship existed between Type II and the subtypes of this group. They state that "serum absorbed with Type II organisms failed to protect against Type II culture but still protected against the cultures of Types II A and II B. Serum absorbed with Type II A organisms loses its protective power for II A and II cultures, but not for II B cultures. Also serum absorbed with II B organisms no longer protects against II B and II cultures, but still protects against II A cultures. Hence, in terms of the protective substances in chicken serum, Types II A and II B are main groups with Type II as a subgroup of them both."

To demonstrate the protective power of the chicken serum, mice were given 1 cc. of the serum intraperitoneally, then given the infecting culture by the same route from 4 to 6 hours later. A protocol is published illustrating the plan of the experiment and the results obtained. The protective substances have been shown to adhere quantitatively to the water-insoluble globulin by means of fractionation of the serum with ammonium sulphate and dialysis.—L. W. F.

2041. Serum Therapy of Advanced Botulism. J. Bronfenbrenner and H. Weiss. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 253–254.

The writers found that death from botulinus toxin was greatly delayed in guinea pigs kept under ether anesthesia, as compared to those which received no ether. Normal guinea pigs of 350 gm. weight given 50,000 minimal lethal doses (M. L. D. = that amount of toxin necessary to kill a 15 gm. mouse in less than 4 days when given intraperitoneally) of botulinus toxin intraperitoneally show symptoms of dyspnoea in 1 hour, and invariably die in about 2 hours. If animals receiving similar injections of toxin are placed under ether anesthesia as soon as dyspnoea occurs and kept under for 2 hours, they will survive for 4 hours; if the period of anesthesia is prolonged, the life of the animal can be correspondingly prolonged. It was thought that advantage might be taken of this delay of the intoxication produced by the anesthetic to permit toxin-antitoxin combination to take place. Two series of guinea pigs were given, *per os*, 50,000 minimal lethal doses of botulinus toxin. The first symptoms of intoxication, under these conditions, appear in about 6 hours, and death follows in about 12 hours. One series of the animals, which had received toxin, was given antitoxin intravenously; the other series was also given antitoxin in a similar manner but at the same time was put under ether anesthesia which was continued for 2 hours. It was found that the pigs in the first series died in 18 hours, while those in the second series survived. Further studies concerning the nature of this phenomenon are under way.—L. W. F.

2042. Separation of Tetanus Antitoxin from Associated Protein. W. N. Berg. J. Am. M. Ass., Chicago, 1921, **76**, 1820.

The author concludes from a large series of experiments that tetanus antitoxin is a substance of non-protein nature. However, the stability of the antitoxin depends upon its association with protein and splits (is lost) when the protein splits. Trypsin digestion destroys the antitoxin at about the same rate that it decomposes protein. This result was obtained in amphoteric, slightly acid, and in solutions containing 0.5 per cent sodium carbonate. In a 0.5 per cent sodium carbonate solution the antitoxin was slowly and completely destroyed while the protein was not affected. The same result was observed in a solution of 0.2 per cent hydrochloric acid.—P. G. H.

2043. Treatment of Acute Poliomyelitis with Immune Horse Serum: Summary of Results. Edward C. Rosenow. J. Am. M. Ass., Chicago, 1920, **77**, 588.

The horse serum is prepared by repeated injection of increasing doses of freshly isolated strains of the pleomorphic streptococcus. The curative power is especially potent when the serum is given early in the disease.—P. G. H.

2044. The Advantage of Serum Therapy as Shown by a Comparison of Various Methods of Treatment of Anthrax. J. C. Regan. Am. J. M. Sc., Phila., 1921, **167**, 406–423.

In an exhaustive review on the treatment of anthrax, Regan discusses the various therapeutic measures used in the treatment of malignant pustule. Mortality statistics for the different methods of treatment are quoted. The disadvantages of various measures of local therapy with attendant danger for the patient that many possess are pointed out. The history of the development of the anti-anthrax serum is fully discussed, along with a review of the foreign and domestic literature relative to its value. Opinion of those who have used this therapeutic serum is favorable. The writer directs attention to the advantages of serum treatment over the older methods employed, and outlines a plan of dosage, with time intervals, to be used in the various forms of the disease. The practical application of local serum therapy instead of the older and more dangerous methods is outlined and discussed from the theoretical basis. The advantages of serum therapy over all other measures of treatment are considered in detail, along with the facts supporting the statements. Among the writer's conclusions of special interest are the following: "Anthrax serum fulfills best the points requisite for an ideal method of treatment of anthrax: (1) It is applicable to all forms and locations of the disease; (2) yields on average the lowest mortality rate; (3) is a specific measure; (4) is a safeguard against generalization of the local disease if used in time; (5) offers the least amount of scarring and deformity; (6) causes a minimum of pain; (7) demands on the average the shortest absence from employment."—L. W. F.

HYPERSENSITIVENESS—ANAPHYLAXIS, ALLERGY

(See also Numbers 1960, 1988)

2045. *Present Views on Anaphylaxis.* Jules Bordet. Johns Hopkins Hosp. Bull., Balt., 1921, 32, 269–275.

In this second Herter Lecture, Bordet states that the problems suggested by anaphylaxis are at least 3 in number. The first has to do with the etiology, the next with the symptomatology of anaphylaxis, while the third has to do with general pathology, that is, with the rôle played by anaphylactic phenomena in the course, symptoms or peculiarities of serum sickness, asthma, tuberculosis with its hypersensitiveness toward tuberculin and intoxications, with special reference to drug idiosyncracy. The author in this lecture devotes special attention to the first of these problems, which must be solved before a correct solution of the others can be found.

Bordet first briefly touches on the different views as to the extent and limits of the field of anaphylaxis, stating that he is strongly inclined to the belief that the actual anaphylactic shock, with all of its characteristic symptoms, though resulting readily and frequently from antigen-antibody interaction, can also be brought about by quite different factors. He then follows chronologically the more important of the discoveries in this field and sums up with the statement that in all cases of anaphylaxis depending on the intervention of antigen the interaction of antibody and antigen represents the primary cause of the accidents. The author also states that the hypothesis that some substances, neither antigens nor antibodies, may precipitate the shock, is not altogether groundless. Next he gives the symptoms of anaphylaxis and briefly considers the part played by different tissues and cells in this phenomenon. This is followed by a discusson of the site of the reaction of antibody and antigen, the author concluding that neither the cellular nor the humoral theory can be exclusively accepted. Bordet does not consider the question of the primary site of the antibody-antigen reaction so fundamentally important as has been claimed but that the chief problem is to elucidate the nature of this reaction. He thinks that in all probability the underlying mechanism consists in the production of a toxic principle derived under the influence of the antigen-antibody complex from the constituents of the surrounding medium, humoral or cellular, a principle to the presence of which the typical disturbances of the sensitive cells are due. The author then proceeds to a consideration of the significance of anaphylatoxin and expresses the opinion that whatever be the site of its production the poison called anaphylatoxin is the causal agent of anaphylactic shock, the etiological problem resolving itself into that of the genesis of this poison. Some of the theories of the origin of the anaphylactic poison resulting from antigen-antibody interaction are next passed in review and the author's experiences in the prouction of agar-anaphylatoxin are described. The author concludes that in neither case is the poison the product of any digested antigen but is derived from the norml constituents of the organism itself by the simple phenomenon of adsorption, in one instance by the agar, in the other by the antigen-antibody complex. Antianaphylaxis is then discussed in connection with both specific hypersensitiveness and agar-anaphylaxis and Bordet states his opinion that antianaphylaxis is due, at least in part, to a modification of the serum, consisting probably in the presence of some substance capable of protecting from the immediate factor of shock, that is from the anaphylatoxin. However, in the case of anaphylaxis of antigen-antibody origin, antianaphylaxis is also in part induced by a neutralization of the antibody.—F. W. H.

2046. *The Relation Between the Disappearance of Foreign Proteins from the Circulation and the Formation of Antibodies.* W. T. Longcope and G. M. Mackenzie. Proc. Soc. Exper. Biol. & Med., N. Y., 1919–20, 17, 133–136.

In previous observations it was found that antibodies such as precipitin, anaphylactic antibodies, and skin hypersensitiveness to horse serum, appeared toward the end of serum sickness when this occurred in human beings following injections of horse serum. It was considered that the cellular reaction indicated by the serum sickness was followed by an excess production of antibodies. This view was supported by the fact that in certain cases where serum sickness did not follow the serum injections, antibodies did not appear in the circulation. No satisfactory explanation has been given for the variation of susceptibility of individuals in this respect.

The present investigation took up the question "whether the presence of antigen, namely, horse serum, bore any relation to serum disease or to the production of antibodies". By means of the specific precipitin reaction, horse serum may be demonstrated in the blood for many days after its injection, either in animals or man. Studies were made upon human beings who had received serum injections for therapeutic purposes in pneumonia. The presence of horse serum was determined at intervals after the injection of the serum by means of the specific precipitin reactions, and at the same time they followed the appearance of precipitin antibodies for horse serum. A series of 14 individuals who had received from 100 to 500 cc. antipneumococcus horse serum intravenously were examined as outlined. The cases fell into two groups. In one group of 8 cases, the persistence of reaction for horse serum continued until the 18th to 39th day, while the appearance of precipitins did not occur until the 6th to the 15th day following the injection. Severe serum disease, lasting from 11 to 28 days, followed the injection of serum in this group. The precipitins as a rule appeared first, or became markedly increased in amount toward the end of the serum disease; the reactions for horse serum diminished rapidly toward the termination of the serum disease and shortly after disappeared. No direct relationship existed between the amount of serum injected and the intensity of the serum disease, nor to the persistence of reaction for horse serum in the circulation. The results in the second group of 5 cases which received 300 to 500 cc. serum injections, differed entirely from those in the first group. In this group, the reaction for horse serum persisted much longer, from 49 to 67 days, and the precipitin formation was either for an extremely short period, or entirely absent. These patients had very mild serum disease, lasting from 1 to 5 days, or none at all. One case which received an injection of 630 cc. of serum was an exception to either of the two groups above. He had a severe serum disease lasting 12 days. The reaction for horse serum in his circulation persisted for over 75 days, also precipitins appeared.

After analysing the results, the authors draw attention to the fact that "individuals vary within very wide limits in their reactions to injections of foreign proteins," and "suggest that those individuals who are relatively insusceptible have some protective mechanism in the serum or in the cells of the body which prevents or delays the union of the antigen, in this case horse serum, with the cells of the body."—L. W. F.

2047. *Sur l'anaphylaxie du coeur isolé du lapin.* (*Anaphylaxis with the Isolated Rabbit Heart.*) C. Heymans. Compt. rend. Soc. de biol., Par., 1921, **85**, 419–420.

The isolated rabbit heart was suspended in a modified Pachon apparatus and perfused with Tyrode solution and with the same solution containing cobra venom. Upon the normal heart cobra venom causes arrest, developing first upon the left side. The heart muscle shows a complete rigidity which can not be thrown into relaxation by subsequent perfusion with Tyrode solution or antivenom serum. A similar sequence of events takes place in the heart *in situ* when subjected to the action of venom. When similar perfusions are performed upon the isolated heart from an animal sensitized to Witte peptone or to Crotalus venom the reaction response is of the same nature as in the cases of the normal heart, but it differs markedly in the time of appearance. Thus, with a normal heart venom in a concentration of 1:1,000,000 causes systolic arrest in 35 minutes; with a sensitized heart venom in the same concentration causes arrest within 4 minutes. The several conclusions derived from the experiments are: (1) the immediate fatal reaction following the injection of venom into sensitized rabbits is due to anaphylactic cardiac shock; (2) in the isolated heart the intensity of reaction to venom is proportional to the sensitization; (3) the cardiac reaction is of cellular rather than of humoral nature; and (4) the cardiac reaction is not strictly specific.—G. H. S.

2048. *Observations on Anaphylaxis in Lower Monkeys.* H. Zinsser. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 57–66.

In a series of experiments upon 5 monkeys Zinsser confirmed the observations of previous workers, that these animals under immunization are poor producers of antibodies. It was also found that antihorse (serum) rabbit serum often gave definite reactions with normal monkey serum. The first two animals were injected with horse serum before the latter fact was discovered. The first monkey (*Macacus cynomolgus*) received a single injection of horse serum. Not the slightest trace of an anaphylactic sensitization could be demonstrated on the monkey's fallopian tube by the Dale method. This was confirmed by intravenous injection of horse serum in the same animal. Also the precipitin test failed to demonstrate the presence of any antibodies. The second monkey (small *Cebus*) received repeated injections of horse serum, and showed the formation of small amounts of antibody (precipitin) appearing 17 days after the second injection, and present 27 days after a third injection. At the same times, reinjection intravenously of the serum caused signs and symptoms mildly analogous to human serum sickness the first time, and slight anaphylactic symptoms followed the last injection. The last 3 monkeys of the series received injections of egg white instead of horse serum. Monkey III (*Macacus rhesus*) showed slight amounts of antibody (precipitin) 25 days after the second injection of egg white. On this date an intravenous injection of 10 cc. (1–5) egg white caused a severe reaction within 2 minutes which completely passed away in 5 minutes. Fifteen days after this injection (third) the animal was re-injected with egg white (fourth injection), and showed a similar reaction to the above. Seventeen days after the last injection just noted a final injection was given again producing the same symptoms. Antibodies were found in small amounts in the animals' blood on each occasion.

Neither Monkey IV nor Monkey V which received injections of egg white showed any antibody production in the blood, nor anaphylactic symptoms following reinjections of egg white.

Tests were made for the presence of antigen in the blood of these experimental animals at periods following their intravenous injections. It was found that this substance rather rapidly disappeared from the circulation. Observations upon the urine of the last animal injected with egg white showed that within a few hours it passed through the kidney with remarkable speed.—L. W. F.

2049. *Observations on the Specific Exhaustion of Cutaneous Reactions.* G. M. Mackenzie and L. B. Baldwin. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, 18, 214–217.

Two quite distinct types of cutaneous reactions occur in hypersensitive individuals. One reaction develops in a few minutes and consists essentially of a wheal and erythema which fades out completely in 1 or 2 hours without any visible evidence of cell destruction. It occurs in patients with hay fever, asthma, or those who are sensitive to foreign serum. Extracts of pollen, animal dandruff and feathers, food proteins, foreign serum, and occasionally bacterial or other proteins will produce the reaction in sensitive persons. The other reaction usually develops after 12 to 24 hours, and is characterized by induration and persistent signs of inflammation, clearly causing cell destruction which required many days to fade out entirely. It occurs with tuberculin, typhoidin, leutin, and mallein in sensitive cases. Certain normal individuals may show reactions similar to the first type of reaction (immediate skin reaction) with non-antigenic substances, as aspirin, salicylates, and quinine, also histamine, morphine, and pituitrin. It would appear to be a vascular phenomenon with localized edema. It has been assumed that the skin reactions of the first type with protein-like substances are manifestations of anaphylaxis. The authors in an effort to determine the nature of this particular skin reaction studied their exhaustibility by a simple procedure. The tests were made on 5 hypersensitive patients, the subjects of hay fever or bronchial asthma. It was found that the reactivity of the skin may readily be abolished in the area involved in the reaction. When "the cutaneous method of eliciting the reaction was employed, the exhaustion was usually not complete until the reaction had been repeated 5 or 6 times on the same site, at intervals of 1 or 2 hours". If "the intracutaneous method was employed and the protein solution injected into the skin, the rapidity with which the local exhaustion can be accomplished was found to vary with the concentration of the protein solution". The duration of the exhaustion was found to some extent to be dependent upon the concentration of the protein solution and the method used to produce the reaction. The reactivity is abolished only in the area which was the site of the reaction, that is, the area, occupied by the wheal; it is only partially exhausted in the erythemic zone, and not at all in the skin outside of this field. If the individual is sensitive to two substances, no stronger reaction occurs when both are given simultaneously in the same area than when one is given singly, apparently no summation of effect. Also there appears to be a strict specificity of the exhaustion for substances biologically unrelated, and something similar to group reaction for substances closely related biologically. Substances used in these studies include egg white, extracts of ragweed and chicken feathers, the proteins of almond, pea, oat and wheat. Studies were made along similar lines to abolish the skin reaction to histamine, a substance which, when applied in solution to a small cut or scarification, produces an urticarial lesion similar in appearance to that observed in the types under study. They found that the histamine skin reaction is not exhaustible. It would appear that the exhaustive reaction only occurs with antigenic substances.—L. W. F.

2050. *Precipitin Formation in Patient with Serum Disease Showing Immediate and Accelerated Reactions.* G. M. Mackenzie. Proc. N. York Path. Soc., 1920, 20, 91–96.

Mackenzie reports a cases showing an immediate and an accelerated (von Pirquet and Schick) serum reaction (following the desensitization procedure in preparation for serum therapy in pneumonia) in which the curves of precipitin and circulating antigen were determined. The patient, 22 years old, was admitted to the hospital suffering from lobar pneumonia; the present history showed that he had twice previously been injected with horse serum,—7 years ago for diphtheria and 2 years ago intraspinally for cerebrospinal meningitis. He reacted to the second injection showing the usual form of serum disease following a first injection. On admission, an intracutaneous injection of 0.02 cc. of a 1:10 dilution gave a strongly positive reaction. Desensitization was started by the usual method, as follows:

TIME	HORSE SERUM	METHOD OF ADMINISTRATION	REACTION
	cc.		
10.30 p.m.	0.025	Subcutaneously	None
11.00 p.m.	0.05	Subcutaneously	None
11.30 p.m.	0.1	Subcutaneously	None
12.00 m.	0.2	Subcutaneously	None
12.30 a.m.	0.4	Subcutaneously	Slight difficulty in breathing
1.00 a.m.	0.8	Subcutaneously	Erythema, site of injection
1.30 a.m.	1.0	Subcutaneously	None
2.00 a.m.	0.1	Intravenously	None
2.30 a.m.	0.2	Intravenously	None
3.00 a.m.	0.4	Intravenously	None
3.30 a.m.	1.0	Intravenously	Swelling, lower jaw
4.00 a.m.	2.0	Intravenously	None
4.30 a.m.	4.0	Intravenously	None
5.00 a.m.	8.0	Intravenously	None
5.45 a.m.	16.0	Intravenously	Erythema on dorsum of fingers, around left eye and on forehead

The method of densensitization employed was inadequate with the hypersensitive patient; he reacted with the 16 cc. intravenous dose of serum with such severe symptoms that it was considered dangerous to continue with larger doses. The erythema became generalized a few minutes after the last injection of serum, and the patient complained of itching of face, hands and back. Urticarial wheals appeared over the elbows, wrists and knees. No edema nor arthralgia occurred; the respiration was not disturbed. A diffuse erythema was present 5 hours later, which disappeared in the next 24 hours. This could be considered as an "immediate reaction". Three days after the serum was administered the patient again showed a generalized eruption, first morbiliform, then urticarial in character, with enlargement of the epitrochlear and axillary lymph nodes. Soft edema appeared on forehead, eyelids, nose, lips, forearms, and other parts of the body, also a few purpuric spots were noted. The second serum reaction persisted for 6 days; it appeared after an incubation of 3 days, and could be considered as an "accelerated reaction". In the study of the presence of precipitin and the precipitinogen (horse serum) in the blood of the patient, it was found that precipitin appeared on the fifth day, the content rapidly increased, and was still present in high concentration 37 days after administration of the serum. When the precipitin reached a high concentration (1–2000) the precipitogen content fell and the symptoms ceased. The observation of special interest in this case is that a hypersensitive individual showing immediate and accelerated reaction also showed an accelerated appearance of precipitin in the circulation. The usual incubation period necessary for the formation of precipitin after the first injection is 8 to 12 days—rarely earlier than the 10th day. It has been demonstrated by animal experiments that reinjections following disappearance of precipitin from the circulation from the first injection produce precipitin again more rapidly than after the first injection. Such a parallelism is apparent in the observations recorded in the case reported.—L. W. F.

2051. Report on Anaphylactic Deaths in Guinea Pigs from Intracutaneous Injection of Small Amounts of Egg Albumin. H. Zinsser and S. T. Wu. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 261–263.

The writers report an observation on sensitized guinea pigs where very minute amounts of a reasonably pure protein caused acute death following intracutaneous injection of the antigen. The autopsy findings resembled those found in pigs dead of anaphylaxis. Six guinea pigs, 3 males and 3 females, ranging in weight form 235 gm. to 265 gm., received intraperitoneal injections of 2 cc. solutions (about 6.6 per cent dry weight) of crystallized egg albumin. Three days later, one pig received intracutaneously 0.1 cc. of a 1–4 dilution of the albumin solution (6.6 per cent) without any reaction. Again 3 days later, all the treated pigs with 3 additional controls, received intradermal injections of 0.1 cc. of a 1–4 dilution of the original egg albumin solution (6.6 per cent). These were carefully observed for skin reactions, but none occurred until the end of 20 hours, when one gave a moderate reaction. Nine days after the primary injection, a second skin test was done upon all the pigs. Intracutaneous injections of 0.1 cc. of a crystallized egg albumin (about 11 per cent by dry weight) were very carefully made to place the entire amount in the skin. Within a few minutes 3 animals became very sick, and 2 of them were dead within 3 minutes; the surviving animal showed anaphylactic symptoms. The wheal at the point of injection showed no material change in size, indicating that the egg albumin had been absorbed only in part.—L. W. F.

2052. The Alkali Reserve of Blood During Acute Anaphylactic Shock. A. A. Eggstein. J. Lab. & Clin. M., St. Louis, 1921, **6**, 555–560.

Eggstein reports the results of experiments on dogs, rabbits and guinea pigs to determine the effect of acute anaphylaxis on the alkali reserve of blood plasma.

The author found rabbits to be unsatisfactory in this study on account of the marked daily variations in the carbon dioxide combining power of their plasma and because anaphylaxis in this species is not always acute.

In dogs, however, he discovered that acute anaphylactic shock is accompanied by an immediate and progressive acidosis; indeed the acidosis precedes the onset of clinical symptoms of shock. If the animal recovers the alkali reserve is quickly restored to normal. Death usually occurred in those cases in which the carbon dioxide combining power of the blood plasma fell below 25 volumes per cent. The author also found that sodium bicarbonate given before shock was produced, beneficially influenced recovery of the dogs though it did not always prevent death even when the alkali reserve was restored to normal.

In guinea pigs the preliminary intravenous administration of large doses of sodium bicarbonate reduced the mortality in acute anaphylaxis 16.7 per cent in a series of 42 animals.—F. W. H.

2053. Concerning Anaphylaxis Following the Adminstration of Diphtheria Antitoxin. J. Bronfenbrenner and M. J. Schlesinger. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 147–148.

It has been observed that the administration of diphtheria antitoxin seldom produces symptoms of anaphylactic nature in human beings, although their sensitiveness to horse protein is fairly wide spread, as demonstrated by serum sickness often following the use of various sera in other conditions. The writers studied the question of apparent tolerance to anaphylaxis during diphtheria intoxication by experiments upon guinea pigs. Such tests showed that "sensitized guinea pigs receiving subcutaneously large excess of diphtheria toxin withstand the intravenous injection of at least five lethal doses of the antigen to which they were previously sensitized. This apparent resistance appears about 12 to 14 hours after the administration of toxin and just about the time when the outward symptoms of intoxication begin to manifest themselves." Studies were made in an attempt to determine, if possible, the mechanism of this phenomenon. They found that "the antitryptic titer of the blood of guinea pigs injected with the toxin does not appreciably deviate from normal up to the time of death." A typical rise of antitrypsin followed an injection of antigen to which they were sensitized, indicating that the mechanism controlling this function remained unimpaired in these animals. Over-neutralization with antitoxin *in vitro*, of the same dose of toxin before injection, failed to protect the sensitized guinea pigs from immediate death, even when a minimal lethal dose of antigen was given intravenously. If the same dose of toxin was heated for 30 minutes at 80°C., it protected pigs from anaphylactic shock just the same as unheated toxin did, but heating for 30 minutes at 100°C. destroyed this property of toxin. As a control to these tests a sensitized guinea pig received peptone in amount 10 times that present in the medium carrying the toxin, then the animal received an intravenous injection of the antigen. The pig died immediately following the injection, thus showing that peptone afforded no protection as might be suspected. These experiments rather support the clinical observation concerning apparent diminution of anaphylactic reactivity during diphtheria intoxication.—L. W. F.

VACCINE PROPHYLAXIS AND THERAPY

(*See also Numbers 1919, 1938, 1974*)

2054. *Diphtheria Prevention Work in the Public Schools of New York City.* ABRAHAM ZINGHER. J. Am. M. Ass., Chicago, 1921, **77**, 835.

The Schick and control test was given to 52,000 school children and reactors were treated with toxin-antitoxin mixture. Natural immunity seems to depend upon on contact immunity and mild infections with the diphtheria bacillus. Children of the well-to-do classes show a higher proportion of positive Schick reactions than children of the poorer classes. Race and hereditary tendencies seem to influence the development of natural immunity. Negative pseudoreactions were found in 20 to 25 per cent of children. After toxin-antitoxin injections, at least 6 months should elapse before testing for immunity. Two injections of toxin-antitoxin mixture do not give as good results as three. All children from 6 months to 5 years should be treated with toxin-antitoxin mixture. Small children need not be given the Schick test, but immunity should not be considered present before a negative Schick test has been obtained.—P. G. H.

2055. *Preparation and Refining of Diptheria Toxin-Antitoxin.* E. J. BANZHOF. Proc. Soc. Exper. Biol. & Med., N. Y., 1919–20, **17**, 154–155.

The diphtheria toxin-antitoxin mixture has been readjusted by adding to each L+ dose of toxin one unit of properly aged antitoxin so that after standing 8 months or longer, late paralysis will occur when injected into guinea pigs. Acute death occurs in 4 or 5 days when 5 mils of the mixture are injected into guinea pigs. The mixture is stabilized by storing in a refrigerator for a month or 6 weeks. After storage, 5 mils when injected into guinea pigs, kill after 20 to 25 days by late paralysis. The properly balanced preparation retains its balance for 8 months or possibly longer. Deterioration is slight, and takes place equally in the toxin and antitoxin, which prevents the mixture from becoming toxic.—L. W. F.

2056. *Besredka's Method of Oral Immunization of Rabbits with Ox-bile and Paratyphoid Vaccine.* A. ZINGHER AND D. SOLETSKY. Proc. N. York Path. Soc., 1920, **20**, 133–141.

In a number of papers published during the past 2 years, Besredka has reported a series of experiments on a method by which rabbits could be actively immunized against the dysentery (Shiga), typhoid, and paratyphoid B bacillus. The immunization produced by the particular method he considers to be the establishment of a local resistance or impermeability of the intestinal wall, rather than a general immunization of the entire body. In this method a vaccine, prepared from bacteria grown on agar slants and heated at 60°C. for one hour, is given *per os*. It is necessary to partly denude the intestinal mucosa, to bring the vaccine in close contact with the solitary lymph follicles of the intestinal wall. This was done by first administering 8 to 10 cc. ox-bile (mixed with licorice powder) *per os*, withholding food until the following morning, when again a similar dose was given; then 2 hours later the vaccine was given through a small catheter, although in the case of the Shiga dysentery vaccine the above procedure was not necessary, since it both denuded the mucous membrane and later rendered the intestinal wall impermeable to its toxin and endotoxin. Animals subjected to this method of immunization Besredka considered resistant to infection due to a resulting impermeability of the intestinal wall to the living organisms and an insusceptibility of the cells to their endotoxins. Normal rabbits receiving *per os* bile and a large dose of living bacteria were infected. Rabbits prepared by bile, when given intravenously a fatal dose (for the unprepared rabbit) of the living organism, after death showed typical lesions, and the living organism (*B. paratyphosus*·B) could be recovered from the gall bladder and small intestinal contents. The same dose of the organism when given intravenously to vaccinated rabbits did not affect the animal. He also found that the fatal infecting dose (intravenous injection) for bile-prepared rabbits was about one-tenth of that necessary to produce a similar infection in rabbits not so prepared. Owing to the practical value of typhoid and paratyphoid vaccination, Zingher undertook a series of experiments along the same lines in an attempt to verify the important findings of Besredka. His work was carried out in rabbits with *B. paratyphosus* B. Full data as to preparation of the vaccines used, the technique employed, with results of each series of experiments are submitted in the report. The following conclusions were drawn from the experiment:

"1. No immunity was obtained in rabbits prepared with ox-bile and given living or dead paratyphoid B bacilli *per os*.

"2. No agglutinin production was noted in rabbits receiving living or dead bacilli *per os* either with or without bile.

"3. The intravenous fatal dose of paratyphoid B for rabbits prepared with bile was only about one-tenth of the amount required to produce a fatal infection in rabbits which were not so prepared.

"4. The killed vaccine of the paratyphoid B is more toxic than the suspension of living bacteria."—L. W. F.

2057. *Observations on the Immunization of Rabbits with Single Strain and Combined Multiple Strain Vaccines.* W. C. Noble, Jr. and R. A. Thomas. Proc. Soc. Exper. Biol. & Med., N. Y., 1919–20, **17**, 190–192.

In a study of antibody response in experimental animals, receiving a vaccine containing either a single bacterial strain or one containing combined multiple bacterial strains, the writers employed typhoid and paratyphoid vaccines which were given to rabbits. The relative amounts of bacteriolysins produced in the animals were determined, rather than the agglutinins as an index to the degree of immunity, although at the beginning and the end of the experimental period the blood serum of each animal used was tested for agglutinins as well as for specific and group bacteriolysins.

Four series of 4 or 5 rabbits each were immunized with the different vaccines. Three series received single strain vaccines, one series each with typhoid, paratyphoid A and paratyphoid B. The fourth series received combined triple vaccine of typhoid and paratyphoid A and B bacilli. All the animals receiving the single strain typhoid vaccine showed a sharp rise in immunity. But strangely a greater production (maximum) of the paratyphoid A lysin (group) occurred than of the specific typhoid lysin (paratyphoid A, 1:700,000; typhoid, 1:75,000; paratyphoid B, 1:400). The series receiving the paratyphoid A vaccine showed a maximum lysin value for the homologus strain of 1:20,000; for typhoid, 1–3,000, and for paratyphoid B, 1:300. The paratyphoid B series showed highest lytic dilution with a heterologous strain, typhoid, 1:950; for paratyphoid A, 1:380, and for paratyphoid B, the homologous strain, 1:350. The fourth series, which received the combined triple vaccine, failed to show as high lysin values for either organism as was shown for that organism in the different series of animals receiving a single strain immunization.

These results, as pointed out in the paper, do not agree with those of some of the previous investigators, and the writers suggest the desirability of further work with improved methods along the same line.—L. W. F.

2058. *Persistencia del germen de la vacuna anticarbunclosa en el organismo.* (*Persistence of the Germ of Antianthrax Vaccine in the Body.*) Alfredo C. Marchisotti. Rev. med. vet., Buenos Aires, 1921, **6**, 15–18; 23–30.

The author, after some discussion of the work of Kraus and Beltrami, describes an experiment in which 27 guinea pigs and rabbits were inoculated with "the vegetative form of the Sivori vaccine, cultivated in 2 per cent peptonized broth, non-lethal for the species". A few days later the animals were killed and cultures made from the heart blood and organs. The anthrax bacillus was isolated from only one animal.

The author also examined a large number of specimens derived from vaccinated animals and comes to the following conclusions:

(1) It is very rarely that strains of *B. anthracis* derived from vaccines are found in the bacteriological examination of anthrax material; (2) the differentiation between the organisms of naturally occurring anthrax and those of vaccines can be made by direct microscopic examination; or better, though more slowly, by investigation of the virulence, in accordance with the criterion proposed by Kraus and Beltrami; (3) the fact of isolating from dead subjects, cultures of anthrax whose virulence, corresponds to that of the vaccines, does not signify necessarily that death was caused by the vaccines; (4) the attenuation of the organism in vaccines being a slow process, it is necessary to proceed with prudence in the interpretation of results, especially of incomplete examinations made a few days after vaccination; (5) death should be attributed to vaccines only when there is observed a true anthrax septicemia and when from the various body fluids and organs, there are isolated cultures whose virulence corresponds to that of the vaccines employed.—F. W. T.

2059. *Ueber die Entkeimung der Kälberlymphe mit Trypaflavin.* (*On Sterilization of Calf Lymph with Trypaflavin.*) Ernst Illert. Centralbl. f. Bakteriol. (etc.), Jena, I. Abt., Orig., 1921, **86**, 49.

Because of the high germicidal efficiency of trypaflavin toward staphylococci and streptococci, the author studied the power to eliminate these organisms from vaccine lymph.

One per cent trypaflavin was found usually to sterilize in from 24 to 48 hours without modifying the efficiency of the vaccine.—R. E. B.

2060. *Ueber eine Modifikation der Pockenimpfung.* (*Modification in Small Pox Vaccination.*) W. HOFFMANN. Schweiz. med. Wchnschr., 1921, No. 34, 790.

The intracutaneous injection of the virus diluted with water is advocated. Vaccination by this method is attended by less physical disturbance and the dangers of secondary infection and of distribution of the virus to other portions of the body are reduced.—G. H. S.

NONSPECIFIC THERAPY

2061. *Studies on the Nature of the Action of Non-specific Protein in Disease Processes. II. Horse Serum and Soluble Toxin.* DAVID MURRAY COWIE AND ROY MARK GREENTHAL. J. Med. Research, Bost., 1921, **42,** 260–268.

One cc. normal horse serum when injected subcutaneously or intravenously into guinea pigs simultaneously with diphtheria toxin protected against a fatal dose and sometimes protected against as high as 8 fatal doses of the toxin. Larger doses of normal horse serum protected against larger doses of diphtheria toxin but the effect was not always proportional. Horse serum was separated into 2 portions, the protein portion (precipitated by alcohol) and the alcoholic soluble portion. The results of experiments with these portions showed that the protecting factor of the horse serum resides in the protein portion. It was found that the alcoholic precipitate from antidiphtheric serum globulin contained only a small porportion of the protective power of the globulin. Hence, the authors are led to believe that the protecting power of the normal horse serum was not entirely due to the presence of diphtheria antitoxin in the serum.—A. C. E.

EXPERIMENTAL INFECTION

(*See also Numbers 1997, 2077*)

2062. *The Pathology of Experimental Pneumonia.* R. L. CECIL. Proc. N. York Path. Soc., 1920, **20,** 62–66.

In collaboration with Blake, the writer carried out experiments on monkeys to differentiate the pathology of the various types of pneumonia, that is, of pneumococcus, streptococcus, and *B. influenzae* pneumonia. The methods of inoculation of the animals, the dosage of each organism studied, and the resulting effects are fully presented. The pathological changes found in the lungs of animals dead from the disease showed a certain similarity of histogenesis with both the pneumococcus and the streptococcus, but *B. influenzae* pneumonia gave entirely different lesions. The lesions in each condition are discussed, and their resemblance to similar types of pneumonia in man are noted.—L. W. F.

2063. *Experimental Bronchopneumonia and Empyema in the Rabbit.* F. P. GAY AND B. RHODES. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18,** 33–34.

In previous studies Gay and Stone succeeded in producing an experimental streptococcus empyema in rabbits which they have described. Early attempts to produce a streptococcus pneumonia in rabbits did not meet with success, perhaps due to the fact that the culture of streptococcus employed had not passed through the pleura of the rabbits. Also apparently the failure was partly due to the method of inoculation, that is, by means of hypodermic injection between the cartilages of the trachea. By the use of a different method of inoculation, and a passage streptococcus culture, they have succeeded in producing broncho-pneumonia and empyema. The passage culture is grown on blood broth, and injected into the trachea of the animal through a catheter followed by forcible insufflation with air. The technic is that described by Winternitz and Hirschfelder. Four animals injected in this way, which either died or were killed in from 1 to 5 days, showed definite consolidation of the lungs, with a sero-fibrino-purulent pleurisy in all but one,—the 24-hour case. A histological study of the lungs apparently showed the characteristics described by MacCallum in interstitial bronchopneumonia.—L. W. F.

2064. *Experimental Inoculations in Scarlet Fever.* GEORGE F. DICK AND GLADYS H. DICK. J. Am. M. Ass., Chicago, 1921, **77,** 782.

Typical scarlet fever was not produced in the experiments reported. Blood serum, whole blood and filtered throat mucus were inoculated with negative results. Thirty inoculations with hemolytic streptococci were made; the authors feel that this series is large enough to discourage further experiments of this sort. If the pleomorphic organism used in 9 of the throat inoculation experiments bears an etiologic relation to scarlet fever, it should be possible by inoculation of a large series of volunteers to produce a rash on the skin as well as on the palate.—P. G. H.

2065. *Investigation of the Virus of Measles.* ANDREW W. SELLARDS AND GEORGE H. BIGELOW. J. Med. Research, Bost., 1921.**42,** 241-259.

Cultures of a small pleomorphic, Gram-staining bacillus were obtained quite regularly from the blood of measles patients taken in the febrile stage. The unusual procedure was the destruction of the activity of the leucocytes by taking the blood into a sodium citrate solution containing saponin. The cultures grew without difficulty on enriched media. They were obtained from 25 out of 31 measles cases.

Three monkeys were inoculated with these strains from measles cases. In 2 the symptoms were vague, consisting only of a diffuse erythema and isolated papules. In one, however, a suggestive cluster of macules and papules developed, some of which became petechial. Histologically these lesions conformed to the description of human lesions. This animal was tested by a reinoculation of the same organism, and no symptoms developed.

Cultures similar to those obtained from measles cases were obtained from the blood of 5 out of 24 control individuals. In their morphology and staining reactions these control cultures closely resembled the strains from measles cases. But fermentation tests showed that at least 3 of them were definitely different from the majority of the measles strains.—A. C. E.

2066. *On the Production of Generalized Syphilis in the Rabbit by Local Inoculation.* W. H. Brown and L. Pearce. Proc. Soc. Exper. Biol. & Med., N. Y., 1919–20, **17**, 167–169.

Rabbits, successfully infected by testicular or scrotal inoculations of well adapted strains of *Treponema pallidum*, usually show a marked reaction at the site of inoculation, but a total absence of generalized lesions. These features of the reaction to infection are so striking as to suggest a causal connection between the two. It has been demonstrated that generalized infections occur, and that the animal's tissues are susceptible to react to such organisms. Therefore in all probability certain inhibitory influences are acting which prevent the production of generalized lesions. These influences may arise from the reaction at the primary focus of infection. If means were taken to reduce or suppress the reaction of the primary infection, the development of generalized lesions might occur. Working on this hypothesis, 3 types of experiments were carried out, i.e., the effects produced by unilateral and bilateral inoculations, the effects of castration, and the effect of suppression of the primary lesions by the use of therapeutic agents. The results of these different series of experiments are submitted with outlines of the procedure.

The writers derived the following conclusions from their investigations: "that the marked character of the reaction which takes place in the rabbit following local inoculation of old strains of *Treponema pallidum* is in a large measure responsible for the absence of generalized lesions; that an inhibitory influence is exerted upon the development of other lesions which is proportionate to the reaction taking place at the site of inoculation and that the reduction, suppression or prevention of this reaction will remove this influence to a sufficient extent to permit the development of a generalized disease analogous to that which occurs in man".—L. W. F.

2067. *The Penetration of Normal Mucous Membranes of the Rabbit by Treponema pallidum.* W. H. Brown and L. Pearce. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 200–201.

Inoculations of 9 rabbits with 2 highly virulent strains of *Treponema pallidum* showed that the organisms were capable of penetrating some portion of the genital mucosa, and setting up an infection without producing the first gross lesion at the portal of entry. The inoculation was made by drawing the sheath of the rabbit forward to form a pouch into which was instilled 0.05 cc. of a testicular emulsion rich in spirochetes. The emulsion was allowed to spread for about 30 seconds before releasing the sheath; only a thin film of it was retained, as between 0.04 and 0.05 cc. ran out and could be recovered. All the animals inoculated by this method have become infected; some showed enlargement and induration of the inguinal nodes within 24 hours, which is the first indication of infection. Later they showed the development of a general lymphadenitis with syphilitic lesions in other parts of the body. At the time this report was made the animals had been under observation for 5 weeks—only one animal had shown a visible lesion at the site of inoculation, although several of them showed characteristic lesions in the testicle and scrotum.—L. W. F.

2068. *Neoplasia in Experimental Syphilis.* W. H. Brown and L. Pearce. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 201–202.

No recorded cases of neoplasia in experimental syphilitic animals is known, although this is not an uncommon sequel to syphilitic infection in man. Brown and Peace have recently, observed an atypical growth arising from the scar of an old syphilitic lesion in the left scrotum of a rabbit which they think may prove to be a neoplasm. Over 2 years after the primary inoculation a slight diffuse infiltration of the left scrotum and a small nodule appeared at the site of an old chancre. While the animal still harbored spirochetes, none could be demonstrated in material from the nodule by dark-field examination. The nodule was excised for histological examination, with a prompt recurrence of growth with a second cutaneous lesion, and marked enlargement and induration of the left inguinal glands. Again no spirochetes could be demonstrated. The histological examination of the cutaneous nodule and one of the excised adjacent glands revealed for the most part atypical epitheloid cells undergoing active proliferation and exhibiting marked invasive tendencies, the appearance resembling a neoplasm more than that of a syphilitic lesion. The condition rapidly progressed in the animal, with loss of weight and other marked symptoms, etc., so it was finally etherized. The post mortem showed a wide spread distribution of nodules identical in character with the original lesions. These nodules were most abundant in the liver and bone marrow. They were also present in the spleen, the lungs, and the kidneys. The authors state that "transplantation of material from an inguinal node gave a vigorous growth in the original animal and attempts to transfer the growth to other animals have apparently been successful."—L. W. F.

2069. *Superinoculation Experiments with Treponema pallidum.* W. H. BROWN AND L. PEARCE. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 255–257.

Basing their interpretation of results of superinoculation experiments with *Treponema pallidum* upon the production of characteristic lesions containing spirochetes, most investigators conclude that one infection affords protection against another. But it has been shown by Brown and Pearce that the lesion produced at the portal of entry may be very slight or absent in a first infection. In a study of the question these investigators carried out a large series of superinoculation experiments on rabbits with 5 strains of *Treponema pallidum* showing a wide range of virulence for these animals. In general, the animals were first inoculated in one or both testicles, while the second inoculation was made intracutaneously, with equivalent doses of a testicular emulsion on the sheath or at the base of one ear. A careful study was made of the reaction to superinoculation "from the period of early primary infection to that of latency following spontaneous healing of primary or generalized lesions including both the local reaction and the subsequent course of the disease." Conditions which appeared to influence either of these reactions were given special attention. Controls for the results were made by parallel observations on the reactions produced by the infection of normal animals. At this time only the results concerning the local reaction were recorded. Four general types of reaction were observed, which are fully described in the paper. Various gradations in the reactions described, with the exception of the first type, may be observed with a first infection of animals inoculated with well adapted strains of *Treponema pallidum.* These studies furnished "conclusive evidence that a local infection together with the usual manifestations of disease may be produced by the reinoculation of animals already infected". The relative virulence of the organisms used for the primary and for secondary inoculation, progress of the original infection (acquired resistance), the presence of actively developing lesions (inhibition), and individual animal variation (native resistance), were factors which influenced the character of the results obtained.—L. W. F.

2070. *Multiple Infections with Treponema pallidum in the Rabbit.* L. PEARCE AND W. H. BROWN. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 258–261.

It has been demonstrated that under appropriate conditions a rabbit with an advanced syphilitic infection may be superinoculated and develop a typical primary lesion. The question arises as to whether the second infection is limited in its effects to the local reaction, or is capable of further participation in the disease produced. In an investigation of this question, rabbits infected with strains of low virulence were reinoculated with strains of high virulence after the original infection had become well established. The primary inoculation was made in one or both testicles, while in the second, equivalent amounts of testicular emulsion were intracutaneously inoculated on the sheath or at the base of the ear. Series of control animals were inoculated and the infections produced observed for comparison purposes. The usual course of the disease produced by each strain afforded a basis for the interpretation of the experimental results. In particular, the type and severity of lesions, and their time and sequence of occurrence were considered. Under given conditions, these are comparatively constant properties of any given strain. In the series of experiments upon which this report is based, a number of instances occurred where the nature of the infection varied from that ordinarily seen with any one of the several strains employed. As an illustration of the results obtained in this investigation, a full report is made on a single experiment, where the animal was first inoculated with a less virulent strain, then reinoculated later with a highly virulent strain. The resulting course of the disease did not follow the usual outward manifestations of either strain. This infection was regarded as one produced by the combined action of the two organisms.—L. W. F.

2071. *Experimental Syphilis.* W. H. BROWN. Proc. N. York Path. Soc., 1920, **20**, 99–116.

Brown directs attention to experimental infection in animals and its bearing upon the problem of human disease. It is important that the infection transmitted to laboratory animals be brought to a state where the analogy between human and experimental conditions is as close as possible. An intimate knowledge of both the human and the animal infection is necessary. The essential sequence of events in the development of an experimental infection are (1) transmission, (2) modification and adaptation, (3) detailed study of the infection produced, (4) and finally application to problems of human infection. An attempt along these lines has been made in the study of syphilis from the experimental standpoint. The infection has been transmitted to apes, monkeys, and rabbits, by previous workers, and in these animals certain lesions, similar to certain ones occurring in man with the disease, have been produced. The writer used rabbits for his studies upon the subject, as they offered the best opportunity for carrying out such studies upon a broad scale. In the present report, he discusses the results of his investigations in so far as they have developed during a course of a few years. Methods of producing the disease in the rabbits, the nature of the local and general lesions produced, and means of inducing the generalized disease in particular are considered. Series of experiments are cited with the results, upon which the conclusions are based. Full descriptions are given on the gross appearances of the types of lesions found in the animals treated under different experimental conditions. The paper affords a valuable summary of experimental work on syphilis, as shown by inoculated rabbits up to the time of presentation.—L. W. F.

2072. Latent Infection in Experimental Spirochaetosis. J. L. Todd. Proc. Soc. Exper. Biol. & Med., N. Y., 1919–20, **17**, 83–84.

In a study of immunity in white rats against *Spirochaeta recurrentis*, the writer made careful examinations for spirochetes in all animals showing resistance to infection, since "it had been suggested that immunity might be maintained by persistent latent infection." The strains of test spirochetes usually produced well marked infection with one or more relapses. Examinations were made daily by taking blood from the tail and making stains of thick dehemoglobinized films. It was found that spirochetes occasionally reappeared in the peripheral circulation after being absent for a considerable period. Often the spirochetes were found in blood films, on 1 or 2 days, after being absent from 10 to 15 days—in one instance after 22 days. Frequently normal infections followed in rats when inoculated with blood of one once infected, although no spirochetes could be found in films after repeated examinations. Such infections occurred with blood of animals 15 to 20 days (once 27 days) after spirochetes were last found in the blood films. The inoculation method is the more reliable one to determine a latent infection. But usually to get sufficient quantity of blood in the past it meant killing the animal.

In those previously infected animals where the spirochete could not be detected in the blood films, a test for latent infection was made by placing the animal under chloroform, and aspirating from 1 to 2.5 cc. from the heart of an adult rat. This procedure could be performed without injury to the animal. By inoculation with blood taken in this manner, spirochetes were shown to be present in an apparently immune rat 32 days after last being seen in the daily examination of blood films. An immunity was demonstrated in animals where these tests did not reveal latent infections.—L. W. F.

2073. On a Method of Producing Chronic Focal Lesions in Animals. H. Zinsser and E. H. Raymond. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 121–122.

Zinsser describes a form of celloidin capsule, the preparation of which probably originated with Dr. Clarke of the College of Physicians and Surgeons of New York City. Small sugar balls or globes, commonly sold as candy, are fastened to small silk threads with a hot forceps. These are dipped 3 or 4 times in celloidin, hardened for a short time in alcohol then placed, in a jar with running water. In the course of 10 or 12 hours the sugar diffuses and leaves a completely closed capsule. The capsule is punctured with a fine needle, the water drained out, and agar inoculated with any organism is injected into the capsule and allowed to harden. The puncture hole is left open. The inoculated capsule is placed in the peritoneal cavity of a rabbit, the incision is closed by sutures, and the animal kept for observation. Generally the rabbits live for months; some become emaciated; others will develop agglutinins. The writer found on opening treated animals after 6 weeks to 4 months, that the capsule still contained the live organisms (streptococcus). It appears that the organisms are protected to some extent against phagocytes and other animal protective factors. The capsules usually lie in a membrane of tissue which has grown about them; fibrin and strands of connective tissue surround them. In one instance, where the capsule remained in place for 4 months, the organism recovered (streptococcus) from the capsule remained culturally and morphologically identical with the one originally put in. The authors suggest that this "furnishes some evidence, at least, against the mutation of streptococci in the animal body advocated by Rosenou."—L. W. F.

2074. Coli Fever and Blood Volume in Dogs. H. G. Barbour and A. J. Howard. Proc. Soc. Exper. Biol. & Med., N. Y., 1919–20, 17, 148–150.

Killed cultures of colon bacilli were used to produce fever in dogs for the study of the mechanism of fever reduction by drugs. In the first series of experiments, subcutaneous injection of a vaccine containing 325,000 million bacilli per cc. were given. After 15 hours (over night) 14 of the animals showed a rise in temperature varying from 0.4° to 1.7°C. above normal. The others showed no elevation of temperature. Another series was injected in the morning with the vaccine containing 1,625,000 million bacilli per cc. In 5 experiments 1 cc. per kilo doses were given with hourly readings, and the maximum temperature increases varied from 2.4° to 1.5°C. When 0.5 cc. per kilo doses were given, the maximum rise was 2.4°C., but when 0.2 cc. per kilo was given an increase of only 0.6°C. occurred. A third vaccine, containing 1,000,000 bacilli per cc., when given in doses of 0.5 and 1 cc. per kilo, gave maximum increases of 1.0 and 1.2°C., respectively. Maximum temperatures were obtained by either the second or the third hour after subcutaneous injections with the last two vaccines. The temperature was usually found somewhat elevated on the second day, and thereafter not at all. As a rule the animal could not be used more than once, as a less pronounced effect was produced after 4 days, even if larger doses were used of the same vaccine,—probably some degree of immunity had taken place. Both fed and fasted animals reacted in essentially the same manner. Sterile abscesses of considerable size developed at the site of injection which broke down after several days. The investigators give the results of the blood studies carried out under these conditions.—L. W. F.

2075. *Dextrose Plethora and Its Antipyretic Effect in Coli Fever.* H. G. BARBOUR AND A. J. HOWARD. Proc. Soc. Exper. Biol. & Med., N.Y., 1919–20, **17**, 150–154.

A study of plethora, and the antipyretic action of dextrose on dogs which have been injected with *B. coli* vaccine in order to produce a fever—so-called coli fever.—L. W. F.

CHEMOTHERAPY

(See also Numbers 1925, 1926, 1942, 1969, 2035)

2076. *A Study of the Histologic Changes Produced Experimentally in Rabbits by Arsphenamin, Neoarsphenamin and by Mercurial Compounds.* J. A. KOLMER AND B. LUCKE. Arch. Dermat. & Syphilol., Chicago, 1921, **3**, 483–570.

Intravenous injections of both arsenic preparations were given to white rats and rabbits. Some were killed at varying intervals after injections. Sections were made of tissues from cerebrum, cerebellum, brain stem and meninges, lungs, heart, liver, spleen, suprarenals and kidneys.

Detailed descriptions are given of histologic changes induced by arsphenamin.

The authors conclude that (1) "the intravenous injection of lethal doses of acid non-neutralized solutions of arsphenamin in experimental animals produces widespread and severe vascular injury characterized by conjestion, thrombus formation and hemorrhage; later cellular degeneration and necrosis takes place" (2) The injection of single large doses produces severe vascular and tissue alterations, particularly in the liver, kidney, suprarenals and spleen. (3) Multiple therapeutic doses produce slight tissue changes insufficient to interfere with the function of the organs.

The injection of single massive and multiple smaller doses of neoarsphenamin produces changes similar to those from the use of disodium arsphenamin.

The administration of mercury to rabbits produced conspicuously, perivascular round cell infiltrations in the brain, and tubular and capsular glomerulonephrosis in the kidneys. The degree of injury is directly proportional to the amount of pure mercury absorbed, irrespective of the kind of preparation and route of administration.—R. D. H.

2077. *Generalized Infection in Syphilitic Rabbits Resulting from the Inadequate Salvarsan Therapy.* J. BRONFENBRENNER AND M. J. SCHLESINGER. Proc. Soc. Exper. Biol. & Med., N. Y., 1920–21, **18**, 94–95.

In previous studies it was observed that salvarsan in very low concentrations markedly stimulated the growth of spirochetes *in vitro*, instead of exerting a spirocheticidal action. It was suspected that introducing minute amounts of salvarsan might also stimulate the growth of spirochetes *in vivo*. The present study concerns this question; it is an attempt to solve the problem by experiments made upon animals. A number of male rabbits with experimental syphilitic orchitis as well as 2 infected females received salvarsan in amounts varying from 0.004 gm. down to 0.000004 gm. per kilo. Several of these animals developed generalized infections. A control series of animals either treated with large amounts of the drug (0.03 gm. down to 0.005 gm. per kilo), or left untreated, showed no tendency to generalized lues, at least, during 14 months following the date of the experiment. The animals with generalized lesions showed an involvement of the mucous membranes, skin and bones, while 2 rabbits developed keratitis. A gumma of the liver was found at autopsy in one of the animals. One of the infected females lost her young twice; a third pregnancy resulted in the birth of distinctly inferior young, all of which died within a month after birth. Owing to the tendency to decrease the dosage of salvarsan in the treatment of syphilis, the writers feel it useful to call attention to the facts observed.—L. W. F.

MISCELLANEOUS

2078. *The Training and Proper Recognition of the Laboratory Technician.* R. B. H. GRADWOHL. J. Lab. & Clin. M., St. Louis, **6**, 644–647.

Gradwohl states that the great demand for laboratory work has produced a situation such that the medical schools cannot furnish enough talent to man the laboratories with graduate medical personnel, since but few physicians select the laboratory as a permanent career. It is, therefore, necessary to depend upon laboratory technicians to do much of the laboratory work. Certain standards should be laid down both for their preliminary training and their technical education. There should also be some sort of board to pass upon the qualifications of technicians and to issue certificates to those who deserve it. The laboratory technicians should form an association for the betterment of their professional status, the purging of incompetent workers from their midst, the enlisting of the interest of women in this work and the stimulation of the entrance of properly trained persons into technicians' schools.—F. W. H.

2079. *The Pigmentation of Heart Muscle.* DAVID H. DOLLEY AND FRANCES V. GUTHRIE. J. Med. Research, Bost., 1921, **42**, 289–301.

The author's conclusions are as follows:

"An exogenous pigment derived from the plant carotinoids and carried in the blood plasma may appear in heart muscle. It is an adventitious pigment and may occur under normal conditions and be exaggerated in disease. It is lipochrome.

"An endogenous pigment derived from disturbed metabolic processes is the pigment proper of brown atrophy of the heart. It is melanin.

"There appear to be just three groups of pigments involved in body metabolism, the lipochrome of exogenous origin, and the melanins and blood pigments of endogenous origin. The capability of melanin formation by cells which normally do not produce it must be admitted as a result of the abnormal metabolism of depression."—A. C. E.

2080. *A Case of Actinomycosis.* "E. F. W." Guy's Hosp. Gaz., Lond., 1921, **35**, 137–138.

The patient was first admitted (March 20, 1920) suffering from appendicitis; an operation was performed and a gangrenous retro-caecal appendix was removed. About a pint of pus was found in the pelvis, from which a culture was made, and *B. friedländer* was recovered in pure culture. Later (May 5, 1920) the patient was sent to a convalescent home where he remained 3 weeks, and gained 12 pounds. When he was discharged the drainage sinus was almost healed. Again he was admitted (Dec. 7, 1920) to the hospital with dragging pain in left hypochondrium. Some weeks previous he had begun losing weight; he had profuse night sweats, and was troubled with a hacking cough. Examination revealed a tender mass, about 3 inches by 2, under the upper fourth of the left rectus, which appeared to be in the liver. On the tenth day after admission, the swelling in the left lobe of the liver was excised. About a dram of thick, necrotic liver tissue was removed, showing suspicious granules which proved on examination to be clumps of actinomyces. About one week later actinomyces were found in the sputum, and finally they were grown from the feces. An autopsy was performed on the body after death, which occurred March 21, 1921. The liver showed abscesses in both lobes, one in the right had gone through to the lung. The base of the right lung was pneumonic; each lobe contained a small abscess. The stump of the appendix was healthy, but a few adhesions were found between the cecum and the parietes.

In discussing the symptoms, physical signs, etc., in the light of the laboratory and autopsy findings, the writer expresses the opinion that the "primary focus in this case was almost certainly the appendix, which is a well recognized site." He also refers to Faucett, who pointed out the importance of examining a film of pus at the time of operation in these cases, as they may thus be detected early with a marked improvement in prognosis. Ordinary cultures fail to pick up the actinomyces.—L. W. F.

2081. *The Specific Adaptation Between Body Fluids and Blood Cells in Invertebrates.* Leo Loeb. J. Med. Research, Bost., 1921, **42**, 277–288.

This paper is a contribution to the study of the evolution of species and individuality differentials in organisms, on which reactions of immunity depend.

Cell fibrin tissue, consisting of agglutinated amebocytes of Limulus was prepared, and its outgrowth in the sera of Limulus and various other invertebrates was compared.

The outgrowth of the cell fibrin tissue was better in Limulus serum than in any other kind of serum tested. Thus it was shown that in invertebrates there exists a "hetero" adaptation between tissues and body fluids. The results of these experiments lead the author to believe that individuality (homoio) reaction does not exist in invertebrates.—A. C. E.

2082. *The Relation Between Spermatogenesis and Leucopoiesis in Acute Infection.* H. E. Meleney and H. Linsky. Proc. N. York Path. Soc., 1920, **20**, 117–119.

It is well known that both spermatogenic cells and leucocytes react quite similarly to radioactive substances and to Roentgen rays. In view of this fact, a study was undertaken to determine whether the injuries to spermatogenesis so frequently observed in acute infections are correlated with the injury to the leucopoietic function as manifested by the absence of leucocytes. A series of 38 cases of acute infections in men within the period of active spermatogenesis was studied. Among these were 18 cases of lobar pneumonia, 6 cases of influenza, 3 cases of typhoid, and the remainder included various infections, such as lobular and bronchopneumonia, suppurative pericarditis, suppurative meningitis, etc. The absence or marked decrease in the number of spermatozoa, spermatids, spermatocytes, and spermatogonia, together with the presence of abnormal developmental forms and giant cells, were the changes sought. The results of the investigation showed that the proportion of cases with injuries to spermatogenesis increased with the duration of the illness, as previously demonstrated by Mills, and the alterations were found to increase in severity with the duration of the infection—4 showed complete loss of spermatogenesis. An analysis of the small series at hand made it very difficult to establish a definite correlation between leucopenia and loss of spermatogenesis. The duration of the illness is a more significant factor in relation to the injury to spermatogenesis than the possible injury to the leucopoietic function. The authors state that "the acute infections, such as influenza, accompanied by leucopenia, is not more likely to be accompanied by injury to spermatogenesis than are other infections, like lobar pneumonia, in which a leucocytosis usually occurs."—L. W. F.

2083. *L'Interprétation des hémocultures par la réaction du virage globulaire. Application de la réaction.* (*The Interpretation of Blood Cultures by the Cell Color Reaction. Its Application.*) P.-P. Lévy. Presse méd., Par., 1921, **29**, 296.

Growth in blood cultures seeded in broth is marked by the development of a violet coloration, which is a constant feature, appearing as soon as growth has become vigorous. In the case of hemolytic organisms, it may precede hemolysis, or be absent. It appears to be due to the formation of intracellular reduced hemoglobin, and may be obtained by the addition of killed bacteria to red blood cells. It is probably a "toxic" phenomenon.

This color reaction may be used to detect growth in order to avoid premature plating (and the concomitant risk of contamination) of blood cultures, as well as for the study of growth inhibition phenomena.—L. A. K.

2084. *The Known Pathogenic Bacteria and the Question of their Prospective Successors.* Jules Goldschmidt. Med. Rev. of Rev., N. Y., 1921, 27, 8–11.

The author speculates on the possibility of other and as yet unknown infective microorganisms taking the place of those we know and cites syphilis as a disease that became a widely distributed scourge and tuberculosis as one that extended its ravages contemporaneously with the decline of leprosy as a wide spread epidemic. He also cites influenza as an example of the appearance of an almost new epidemic as the first reliable description of it appeared in 1830.

The author states that the fact that diseases spontaneously arise and vanish makes it probable that the more successfully we fight existing infections, the more we clear the field for hitherto unknown microbes whose development is now restricted by the competition of a stronger already better adapted species; this consideration, however, will not interfere with the strenuous warfare of bacteriology and hygiene against these foes.—F. W. H.

THIS NUMBER CONTAINS TITLE PAGE FOR VOLUME IV

VOLUME V NUMBER 11

ABSTRACTS
OF
BACTERIOLOGY

UNDER THE EDITORIAL DIRECTION OF THE
SOCIETY OF AMERICAN BACTERIOLOGISTS

NOVEMBER, 1921

EDITOR
A. PARKER HITCHENS

It is characteristic of Science and Progress that they continually open new fields to our vision.—PASTEUR

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ABSTRACTS OF BACTERIOLOGICAL LITERATURE

CHARACTERIZATION AND CLASSIFICATION

(*See also Numbers 2168, 2364*)

2085. *Beiträge zur Frage der Verwandschaftsverhältnisse der Leguminosen-Knöllchenbakterien und deren Artbestimmung mittels serologischer Untersuchungsmethoden.* (*Contribution to the Question of Relationships of the Legume Nodule Bacteria and their Species Determination by Serological Methods.*) J. VOGEL AND ZIPFEL. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1921, **54**, 13–34.

This is a detailed study on the preparation of immune sera by means of *B. radicicola* cultures. Agglutinin and precipitin reactions by means of immune sera were utilized in separating the groups of legume bacteria which are able to infect specific leguminous plants. By the use of homologous sera, the leguminous bacteria are separated into several groups, agreeing with those found by inoculation tests.

I. *Lupinus* bacteria. Immune serum of *L. angustifolius* bacteria agglutinates, in an equal measure to homologous bacteria, also those of *L. luteus*, *L. perennis* and *Ornithopus sativus*, without having any influence on species II to VI.

II. *Trifolium* bacteria. Immune serum from *Tr. pratense* bacteria agglutinates, in addition to homologous bacteria, also those of *Tr. incarnatum*, *Tr. repens* and *Tr. hybridum*, and has no action on the other 5 species.

III. *Medicago* bacteria. Immune serum from *Medicago sativa* bacteria agglutinates, in addition to homologous bacteria, also those of *Medicago lupulina*, *Melilotus albus* and *Trigonella foenum graecum* and has no action on the other 5 species.

IV. *Pisum* bacteria. Bacteria from *P. sativum* agglutinate, in addition to the homologous form, only the bacteria of *Vicia sativa*.

V. *Faba* bacteria. Immue serum from *Vicia faba* bacteria agglutinates only the homologous bacteria and no others.

VI. *Phaseolus* bacteria. Immune serum of *Phaseolus vulgaris* agglutinates only homologous bacteria and no others.

This method of serum agglutination can also be applied to the study of legume bacteria found in the soil. *Azotobacter chroococcum* and *Bacillus radicicola* are found to have no relation whatsoever, when studied by means of serum agglutination.—S. A. W.

NEW SPECIES

(*See Number 2119*)

BACTERIAL NUTRITION AND METABOLISM

2086. *Food Accessory Factors in Bacterial Growth. III. Further Observations on the Growth of Pfeiffer's Bacillus.* DAVID J. DAVIS. J. Infect. Dis., Chicago, 1921, **29**, 171–177.

Pfeiffer's bacillus grows feebly on mediums containing unheated blood but grows profusely on such mediums heated to 60°C., or higher for definite periods of time. This is due, perhaps, to the fact that changes in the hemoglobin occur on heating which render it more suitable to the metabolism of the organism. Heating blood in the autoclave for a few minutes or at a lower temperature for a longer time renders blood media incapable of supporting growth. This heated blood may be rendered suitable by the addition of various plant, animal and bacterial extracts, which in themselves do not support growth of the organism. These extracts lose their reactivating property on heating in the autoclave for a few minutes or at a lower temperature for a longer period of time. According to the author the growth process of Pfeiffer's bacillus may be represented thus: plain medium plus heat resistant substance (hematin or derivative) plus heat labile substance equals growth of Pfeiffer's bacillus.—L. C. H.

2087. *The Accessory Factors in Bacterial Growth. IV. The Satellite or Symbiosis Phenomenon of Pfeiffer's Bacillus.* DAVID J. DAVIS. J. Infect. Dis., Chicago, 1921, **29**, 178–186.

The satellitism of Pfeiffer's bacillus, whereby the colonies appear larger and more profuse close to colonies of other organisms, is explained on the basis of the addition of the heat labile substance described in the preceding paper.—L. C. H.

2088. *The Accessory Factors in Bacterial Growth. V. The Value of the Satellite (or Symbiosis) Phenomenon for the Classification of Hemophilic Bacteria.* David J. Davis. J. Infect. Dis., Chicago, 1921, **29**, 187–189.

Members of the hemophilic group, such as *B. influenzae*, *B. pertussis*, the Morax-Axenfeld bacillus, Ducrey's bacillus and the Koch-Weeks bacillus were subjected to the test of satellitism. None of the hemophilic bacteria influenced favorably the growth of adjacent colonies of *B. influenzae*. In other words Pfeiffer's bacillus is not favorably influenced in its growth by homologous or heterologous strains of hemophilic bacteria.—L. C. H.

2089. *The Effect of Pepton upon the Production of Tetanus Toxin.* Harriet Leslie Wilcox. J. Bact., Balt., 1921, **6**, 407–417.

The use of Martin peptone broth for the production of tetanus toxin was found unsuitable. The toxin production was highly variable in point of potency when compared with the results which used to be obtainable when Witte's peptone was available. A peptone known as "Berna" peptone, prepared by the Swiss Vaccine and Serum Company, of Berne, Switzerland, and advertised as being prepared by the Witte recipe was found to give as potent toxin as Witte's peptone broth although not so uniformly. In the absence of Witte's peptone, "Berna" is considered a satisfactory substitute.—I. S. F.

2090. *The Inability of Staphylococci to Form Indole from Protein, Peptone and Tryptophane.* S. Bayne-Jones and Pauline Zinninger. Johns Hopkins Hosp. Bull., Balt., 1921, **32**, 299–301.

This investigation was undertaken because of the uncertainty as to the ability of staphylococci to produce indole. One hundred and fifteen strains isolated from pathological lesions in man, human feces, air and putrid meat were studied. A number of media were used; one and 10 per cent solutions of peptone, a tryptic digest of casein, egg white and a solution in which tryptophane was the only source of nitrogen. These media were tested for indole before inoculation and for tryptophane. The cultures were incubated aërobically with the exception of those in egg white. Tests for indole were made with ether extracts of fluid cultures and with distillates of some of the cultures in peptone water, using Ehrlich's reagent as a routine, frequently supplemented, however, by other tests. A positive indole reaction was not obtained in any case.

The authors believe their results, though only presenting negative evidence, warrant the conclusion that indole is not a product of the metabolism of the staphylococcus.—F. W. H.

2091. *On the Growth and the Proteolytic Enzymes of Certain Anaerobes.* K. G. Dernby and J. Blanc. J. Bact., Balt., 1921, **6**, 419–430.

Studies of the limiting and optimal H-ion concentrations for the growth of a group of anaerobes—*Clostridium sporogenes, C. histolyticum, C. canadiense, C. putrificum,* and *C. perfringens*—indicated that the range pH 5–9 represents viable limits, with a point pH 7 as the optimal in a rather broad range. Filtrates from cultures of *C. sporogenes* and *C. histolyticum* liquefied gelatin and disintegrated peptone in the range pH 4 to 8. The optimum pH for both hydrolyses was at about pH 6.0. The active enzymic substance in these filtrates appears to be a "tryptase."—I. S. F.

2092. *The Production of Ammonia and Carbon Dioxide by Streptococci.* S. Henry Ayers, Philip Rupp and Courtland S. Mudge. J. Infect. Dis., Chicago, 1921, **29**, 235–260.

The Eldredge fermentation tube can be used to measure small amounts of carbon dioxide produced in liquid mediums. In suitable mediums streptococci produce ammonia and carbon dioxide. With many strains the production of ammonia and carbon dioxide is correlated. Both are formed apparently from some ingredient of peptone present in small amounts. Not all makes of peptone can be used. Streptococci also form carbon dioxide but not ammonia from dextrose. By the use of these tests it has been possible to separate groups of streptococci which, on the basis of ordinary physiologic tests, were considered identical.—L. C. H.

2093. *Über die Giftwirkungen der Nitrate auf niedere Organismen. (The Toxic Action of Nitrates on Microorganisms.)* Hildegund Böttger. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1921, **54**, 220–261.

Nitrate solutions have, in certain concentrations, a toxic action on microorganisms, both those that are able and those that are unable to assimilate nitrates. With an increase in concentration there is caused an increased injury to the microörganisms till a maximum is reached when the protoplasm is destroyed. With a certain species of *Saccharomyces* the author found it possible to shift the upper limit of concentration by gradual adaptation. The upper and lower limits depend upon the specificity of the organism. In many species of yeasts, fungi and denitrifying bacteria, which assimilate nitrates, the limits are resultants of the stimulative and injurious actions. The toxic action is greater in artificial media than in plant extracts. The various functions of the protoplasm may be differently affected.

The toxic action of the nitrates is due to both the metallic-ion and to the NO_3-ion. The metals act as toxins in the following order: Ca, Mg, Na, K, the first being most toxic.—S. A. W.

THE D'HERELLE PHENOMENON—BACTERIOPHAGE

2094. *Hemolytic Exudates and Transmissible Bacterial Autolysis.* JULES BORDET. Johns Hopkins Hosp. Bull., Balt., 1921, **32**, 302–304.

Bordet first discusses the mechanism through which a given variation, occurring at a certain moment, may be transmitted to the offspring and then proceeds to bring the views expressed into harmony with certain experimental facts connected with the problems of immunity, which have been observed by himself and his co-worker, Ciuca.

They have found that if a guinea pig is inoculated with a fluid culture of *B. coli* on 2 or 3 occasions at intervals of 5 or 6 days and if a few drops of the leucocytic peritoneal exudate is removed 24 to 48 hours after the last inoculation and added to a small amount of a culture of *B. coli*, this exudate modifies the colon bacillus in such a manner that it confers upon it a highly marked and transmissible autolytic power. The culture so treated also has acquired certain other characteristics that are permanently transmitted: it grows as a white, opaque, thick, mucoid layer on agar but is incapable of acting on neutral broth; its virulence is increased and it is less phagocytable.

Bordet also discusses the phenomenon of d'Herelle and the latter's explanation of this on the basis of a living invisible virus, the "bacteriophage." The author thinks d'Herelle's explanation of the experimental facts he discovered is incorrect and that the true explanation both of this phenomenon and of Bordet's modification of *B. coli* is that the conflict between the leucocytes and the bacteria has resulted "in inducing an hereditary vitiation of the bacterial metabolism, consisting chiefly in the production by the microörganism itself of some autolytic ferment which diffuses into the surrounding medium and consequently acts in the same way on normal bacteria belonging to the same species, when these are added to the active fluids."—F. W. H.

2095. *Le bacteriophage. Son rôle dans l'immunité.* (*The Bacteriophage and its Rôle in Immunity.*) F. D'HERELLE. Presse méd., Par., 1921, **29**, 463–464.

This paper is an excellent summary of the author's previous published observations and deductions concerning the lytic principle which he discovered. The fundamental properties of the bacteriophage are reviewed. Its habitat is the intestinal tract of animals, from man to as low as the silk worm. It may pass into the circulation. In every case of intestinal disease, no matter how mild, a bacteriophage active against some intestinal microörganism may be isolated from the feces at the beginning of the illness. This is a manifestation of beginning defensive reaction within the intestine. It is present in very mild attacks of disease. It is absent in those cases which succumb, where the conditions are unfavorable to its development, and the invading organisms triumph. It can always be isolated in early convalescence. In a series of infectious diseases investigated—typhoid fever, dysentery, plague, hemorrhagic septicemia of the buffalo—it could always be isolated during convalescence, but never in the active cases of the disease, nor in fatal cases.

In the study of epizootics of fowl typhoid, hemorrhagic septicemia of the buffalo, and plague of the rat, the bacteriophage specific against the infecting organism could be isolated from all convalescent and unaffected animals, whereas those destined to die never carried it. "An epizootic ceases when all the susceptible individuals are contaminated by the active bacteriophage."

Experimentally, animals receiving small doses of artifically propagated bacteriophage can be made immune to natural or experimental infection. This was demonstrated in the course of an epizootic of fowl typhoid. Feeding or subcutaneous injection of a bacteriophage active against *Bact. gallinarum* stopped the epizootic, while in the poultry yards where no such inoculations were made, the epizootic continued. The use of the bacteriophage for the treatment of diseased fowls reduced the mortality, which was 95 per cent in the untreated animals. The mortality was thus reduced to 10 per cent. In hemorrhagic septicemia of the buffalo, 0.25 cc. of a bacteriophage active against the infecting organism, injected subcutaneously, protected against 1000 fatal doses. The blood of animals immunized in this manner, in 500 cc. doses, confers immunity upon normal animals. Similarly, rabbits can be made resistant to the toxin of *B. dysenteriae* by previous administration of the specific bacteriophage. In cases of human dysentery, 1 cc. of bacteriophage brought on convalescence in 24–36 hours. These observations indicate that immediate attempts at immunization of men exposed to plague or dysentery should be made.

Finally, injections of repeated doses of the bacteriophage may make an animal hypersusceptible. Its serum may then be used to sensitize normal animals, so that infection and death result from otherwise innocuous doses of the bacterium against which the bacteriophage was prepared.—L. A. K.

BACTERIOLOGICAL TECHNIC

(*See also Number 2366*)

2096. *A New Modification and Application of the Gram Stain.* G. J. HUCKER. J. Bact., Balt., 1921, **6**, 395–397.

The author has developed a modified Gram stain which can be used in the direct microscopic examination of the bacterial flora of milk. It has been used successfully for routine examinations of milk samples at a cheese factory with the purpose of differentiating between the undesirable gas-forming types and the desirable lactic acid organisms. The solutions and procedures are as follows:

Gentian violet solution

Anilin oil	3.0 cc.
Alcohol (absolute)	7.0 cc.
Water	90.0 cc.
Shake; filter	
Gentian violet (Grübler)	2.0 grams

Iodine solution

Iodine	1.0 gram
KI	2.0 grams
Water	300.0 cc.

Decolorizing solution

Aniline oil (2 parts) Xylol (1 part) } mixture	5 parts
Alcohol (95 per cent)	95 parts

Counter stain

Bismarck brown	4.5 grams
Water (boiling)	50.0 cc.
Filter	
Alcohol (95 per cent)	30.0 cc.

"The milk smears were prepared by the usual Breed method (Breed and Brew, N. Y. Agr. Exp. Sta. Tech. Bull. 49, 1916) i.e., depositing 0.01 cc. of milk on a clean glass slide and spreading with a needle over an area of 1 sq. cm. The smears were dried and placed in xylol until the fat was dissolved, removed, drained, and immersed in 95 per cent alcohol for 2 minutes for fixing. The slides before being allowed to dry were placed in the gentian violet for 45 seconds, blotted or allowed to drain after removing from the stain, and immersed in Gram's iodine solution for one minute, destained in the aniline-xylol-alcohol solution until no more stain could be removed; and then counterstained in Bismarck brown for 45 seconds."—I. S. F.

2097. A New Method for the Staining of Bacterial Flagella. H. G. PLIMMER AND S. G. PAINE. J. Path. & Bacteriol., Edinb., 1921, **24**, 286–288.

The following ingredients are employed in making up the stain:

Tannic acid	10.0 grams
Aluminium chloride (hydrated)	18.0 grams
Zinc chloride	10.0 grams
Rosaniline hydrochloride	1.5 grams
Alcohol, 60 per cent	40.0 cc.

Place the solids in a mortar, add 10 cc. of the alcohol and mix thoroughly, care being taken to smash up all the zinc chloride. Stir in the rest of the alcohol slowly. At this point the mass goes gradually into a viscous solution of a deep red color, and in this state appears to remain stable for several years. For use, dilute with water, 1 part of stain to 4 of water, when nearly complete precipitation occurs, a small amount remaining in solution as a balanced colloid.

Method of application:

1. The culture must be 18–24 hours old and must be removed carefully. Slides should be cleaned with chromic acid, and all grease removed by roasting them over a bunsen burner. When they have cooled to blood heat, a small drop of the bacterial suspension is placed at one end, the slide tilted and the drop allowed to run down, or it may be smeared gently with a strip of gutta percha tissue. Quick drying of the film seems to be important, hence the warm slide. No fixing is required.
2. Apply the diluted mordant, allowing it to stand 1 minute after mixing with water. Filter onto the slide and allow to stand for one minute, when a slight surface bronzing should be visible. Wash rapidly under the tap.
3. Flood the film with cold carbol fuchsin for 5 minutes, wash, dry and examine in oil. If satisfactory, mount in balsam or euparal.

The advantages claimed for this method are:

1. The ease with which successful preparations are obtained, making it a useful stain in the hands of inexperienced students.
2. It is possible to have the background absolutely free from stain.
3. The flagella are uniformly stained without the appearance of granular deposits, and do not appear to be unduly magnified.
4. The mordant is a one-solution stain, seems to keep indefinitely in a well-stoppered bottle and is always ready for use.

5. The materials are relatively cheap, as compared with other methods using osmic acid as a fixative.

Arrangements for the manufacture and supply of the stain have been made with Mr. G. T. Gurr, 35 Perrymead Street, Fulham, London.—I. W. P.

2098. *Methods of Isolation and Cultivation of Anaerobic Bacteria.* ARTHUR I. KENDALL, MARJORIE COOK AND MARJORIE RYAN. J. Infect. Dis., Chicago, 1921, **29**, 227–234.

Much discussion of the action of anaerobes, especially their proteolytic activity, has been caused by the presence in such cultures of unrecognized and hence unsuspected contaminants. Many anaerobes grow in unrecognized symbiosis with other organsims and are obtained in pure culture only with great difficulty. The authors advocate the Barber single cell technic, using heated sporulated cultures and picking single spores. By using media containing bits of meat, thoroughly sterilized and by other devices to obtain exclusion of oxygen they have raised the percentage of successful isolations from 1 or 2 per cent to 35 per cent.—L. C. H.

2099. *Color Standards for the Colorimetric Measurement of H-ion Concentration.* LOUIS J. GILLESPIE. J. Bact., Balt., 1921, **6**, 399–405.

The author is in disagreement with the published data in the paper by Medalia (J. Bact., 1920, **5**, 441–468) on the grounds that they are not in agreement with other published data and are not correct. He describes a simple colorimeter for use in measuring the dissociation of two-color indicators and for determining the hydrogen-ion exponent of solutions by the colorimetric method.—I. S. F.

2100. *L'Isolement des bacilles typho-paratyphiques dans les selles par le procédé du tube de gélose strieé. (The Isolation of Typhoid and Paratyphoid Bacilli from the Feces by the Streaked Agar Tube Method.)* P. P. LÉVY. Presse méd., Par., 1921, **29**, 704–705.

The author suggests the isolation of enteric organisms from feces on long slants of litmus lactose agar, whose surface has been scored longitudinally with a heavy spatula. The tubes are inoculated at the base of the slant with a capillary pipette, emulsifying the feces if they are not already fluid. Typhoid and paratyphoid bacilli being motile, grow up the slant, and may grow in isolated colonies a few millimeters above the mass of growth at the base of the slant. Where the feces are rich in the flora sought, the results are as good as those obtained by the use of Petri dishes of the same medium. Where the bacteria are scanty, the use of both methods is desirable.—L. A. K.

2101. *Ueber die Verwendung des Dunkelfeldes zur Auffindung der Gelbfieber-, Gelbsucht-, Syphilis- und anderer Spirochäten in fixierten und gefärbten Ausstrich- und Schnittpräparaten. (The Use of the Dark Field in Demonstrating the Yellow Fever, Jaundice, Syphilis and other Spirochetes in Fixed and Stained Smears and Sections.)* ERICH HOFFMANN. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 65.

Dark field illumination of the material, whether stained or not, permits a prompt discovery of the spirochetes if they are present.—B. C.

2102. *Ueber die Lebensdauer und anaërobe Züchtung der Gonokokken. (The Viability and Anaerobic Culture of Gonococci.)* A. BUSCHKE AND E. LANGER. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 65–67.

Small test tubes are filled with 2 to 3 cc. of blood serum and covered with sterile liquid paraffin. Cultures of gonococci are transferred to these by means of a fine capillary. The organisms are preserved in a viable state for several months and their virulence remains unaltered. Wide fluctuations of temperature are well tolerated by the gonococcus in this medium.—B. C.

2103. *Zur Darstellung des Streptobazillus des weichen Schankers mit Rongalitweiss nach Unna. (Demonstration of the Streptobacillus of Soft Chancre with Rongalit White According to Unna.)* WALTHER KRANTZ. München. med. Wchnschr., 1921, **68**, 240.

This is a modification of Unna's technic. The air-dried, unheated smear is stained with rongalit white (a decolorized methylene blue) for 2 minutes. Rinse in flowing tap water and heat briefly in the flame. Dilute ammonia, 1:10, is then dropped generously on the smear, which becomes blue. Rinse again in flowing tap water and dry by gentle heat. The streptobacilli are seen as deep blue strings in a pale blue field.—B. C.

INDUSTRIAL BACTERIOLOGY

2104. *The Prevention of Sugar Deterioration.* NICHOLAS KOPELOFF, C. J. WELCOME AND LILLIAN KOPELOFF. La. Agr. Exper. Sta., 1920, Bull. 175, 58 p.

The subject is treated in six parts: I. The prevention of sugar deterioration by the use of superheated steam in centrifugals. II. The deterioration of Cuban raw sugars in storage. III. Further studies in the deterioration of a variety of sugars in storage. IV. The formation of the gum, levan, by mold spores. V. The formation of the gum, levan, by mold spores. Mode of formation and influence of reaction. VI. Practical deductions.

The various phases of this work were published currently and have been reviewed from other sources. (See Abs. Bact., **3**, 11; **4**, 21, 1568; **5**, 349, 925.)—J. M. S.

MYCOLOGY

2105. A Rabbit's Kidney Affected with a Parasitic Mould. F. J. F. Barrington. J. Path. & Bacteriol., Edinb., 1921, **24**, 347–348.

A rabbit in which the lumbar splanchnic nerves had been divided through a median abdominal incision, under aseptic precautions, became ill and was etherized 2 months later. The right kidney was found to be greatly enlarged, with a length of 5.5 cm. as compared to a length of 3.75 cm. in the left. The perirenal tissues were edematous. The kidney surface was slightly granular and pale yellow, with brown mottlings. The cut surface showed the pyramid and the medulla next it to be yellowish white, sharply marked off from the rest of the kidney by a zone of a yellowish color similar to that on the surface, from the outer surface of which thin streaks radiated to the cortex and formed the centres of the granules observed externally. Sections were stained with haemalum and eosin, Gram and alum carmine, Ziehl-Neelsen and Giemsa, and frozen sections were done with haemalum and scharlach. In the papilla the tubules, though visible, lacked nuclear staining. In the zone of demarcation the kidney structure was not recognizable, and numerous mononuclear cells were present, some degenerating, others filled with fat, which occurred also extracellularly. Toward the periphery a branched mycelium was present in the streaks, closely surrounded by mononuclear and eosinophilic cells, many of them degenerating. Giant cells were present in the periphery of the masses of mycelium and small cells, and contained fat and pieces of mycelium. Between the streaks the kidney structure was recognizable, with dilatation of the tubules and increase of interstitial tissue, but in the centre of the streaks there was necrosis.

The fungus possessed a branched mycelium varying in diameter from 2.5 to 14.5 microns. It was Gram-negative, not acid fast and stained purple with Giemsa. In sections stained with haemalum and eosin, it stained weakly with haemalum and strongly with eosin, and so usually appeared red. The mycelium had the appearance of an empty tube and no nuclei were found. In places the mycelium contained fine, hematoxylin-staining fibrils, running longitudinally or in a coarse network, while in others it contained a homogenous, eosinophilic substance. Fat was sometimes present in the mycelium and septa were seen very infrequently.—I. W. P.

SOIL BACTERIOLOGY

(See also Number 2085)

2106. Die schädliche Wirkung der Strohdüngung und desen Verhütung. (The Injurious Action of Straw Manuring and its Prevention.) Otto Rahn. Ztschr. tech. Biol., 1919, **7**, 172–186. (Centralbl. f. Bakteriol. (etc.), 2. Abt., Ref., 1921, **53**, 413.)

Easily assimilable carbon compounds are present in the soil only in minute quantities. NH_3 and HNO_3 can therefore accumulate. The addition of straw and other plant substances rich in nitrogen stimulate an increase of microorganisms, a nitrogen minimum may then take place. This will appear more readily and last longer in nitrogen-poor than in nitrogen-rich soils. During this condition, the plants cannot obtain any nitrogen from the soil. With stable manure, there is no fear of a nitrogen-minimum, since the manure contains easily assimilable organic compounds, which, together with the nitrogen compounds of the soil, are sufficient to satisfy the straw decomposing organisms. A nitrogen-minimum is possible only in the manuring with straw and in compost heaps. It can be overcome by means of nitrogen-fertilization. This nitrogen is then chiefly stored away and with unfavorable atmospheric and soil conditions, even denitrified, so that it is not directly available to plants. The fertilization with nitrogen offers the only possibility of doing away with the nitrogen-minimum. The nitrate is more active than ammonia. With anaerobic straw decomposition, the end products are still good sources of carbon for many aerobic organisms, even for denitrifying bacteria. This is the necessary consequence of the energy balance in anaerobic phenomena. The toxins produced in the decomposition of nitrogen-poor substances injure the young plant seedlings.—S. A. W.

2107. The Effect of Straw on the Biological Soil Processes. T. J. Murray. Soil Sc., Balt., 1921, **12**, 233–260.

The present investigation was undertaken in order to determine why the addition of straw to the soil (which is the only method of return of humus to the soil practiced in the wheat country of east Washington) causes a decrease in the crop yield which follows treatment. In these experiments, first, various amounts of straw were added to soil tumblers to determine the influence on nitrate formation and total nitrogen content of the soil; second, the effect of straw upon the number and types of bacteria in the soil was considered; third, the effect of straw on nitrogen-fixation, ammonification, and denitrification; while fourth, the isolation of nitrate forming bacteria and the effect of straw and pure cellulose upon them were studied.

The results were as follows: The addition of straw has a harmful effect on nitrate accumulation in the soil after a given time, and is proportional to the amount of straw applied. Total nitrogen is not lost to the soil but is transformed. An increase in straw causes a decrease in the nitrates present in the soil. Straw acts as a source of energy for the nitrogen fixing bacteria, the amount of fixation not being dependent on the amount of straw applied. Ammonification is inhibited proportionally to the increase in straw above 0.9 per cent. An increase in straw causes an increase in bacterial numbers, but has no apparent effect on the types. Nitrates that are used by the bacteria are not left as nitrites but probably as organic nitrogen. Cellulose from either filter paper or straw has no effect on the nitrate-forming bacteria.

The author's conclusion is that straw applied to the soil stimulates the reproduction of bacteria since they use it as a source of carbon. "The nitrates used by the organism are transformed to organic nitrogenous material and for the time being are lost as available plant food." The intensity of the reaction depends on the amount of straw.—N. K.

2108. *Soil Acidity and Bacterial Activity.* R. E. STEPHENSON. Soil Sc., Balt., 1921, **12,** 133–144.

Studies were made on the effect of organic materials on the reaction of the soil, employing a heavy silt loam, a sandy soil (both low in organic matter), and a loam soil (rather high in organic matter). Organic materials of general use were studied, such as farm manure, cottonseed meal, horse manure, timothy hay, clover hay, green timothy, and green clover. Applications were made at the rate of 10 tons per acre of air-dried material on the basis of 2,000,000 lbs. of soil per acre. Experiments were conducted in one gallon jars, samplings being made at intervals of 2, 5; 10, 15 and 22 weeks.

Ammonia was determined by the aeration method using potassium carbonate, nitrates by the phenoldisulphonic acid method, modified by Davis, and acidity by the modified Tacke method.

While no definite conclusions are drawn from this limited study, it appears that the essential soil organisms are active in soils of at least moderately strong acidity. The data also indicate that the decay of organic matter under aerobic conditions does not produce any appreciable acidity except where nitric acid is formed in nitrification. Ammonification was apparently greater in the absence of lime, partly because of the reduced activity of the nitrifying organisms. Lime generally stimulates nitrification. The sum of ammonia and nitrates was usually greater on the unlimed soil when treated with nitrogenous organic materials, due partly to the increased number of organisms in the presence of lime and their greater consumption of ammonia and nitrates. When nitrogenous sources of energy such as horse manure and timothy hay were supplied, nitrification and ammonification were reduced below that of the untreated soil. The green materials were attacked somewhat more readily than the dry matter. There was a greater production of ammonia and nitrates partly due to the increased nitrogen content of the mature plants. The soluble non-protein nitrogen determined at the second sampling on the more fertile soil, when the activity of the organisms was nearly at a maximum showed little effect due to the various organic treatment. The cottonseed meal was the only treatment which gave any large increase over the untreated soil. In all cases but one, the unlimed treatment gave a higher non-protein nitrogen content than the lime soils.—N. K.

2109. *Nitrification in Some South African Soils.* THOMAS D. HALL. Soil Sc., Balt., 1921, **12,** 301–363.

The object of the investigation was to get some quantitative data on nitrification in South African soils, and consequently a basis for comparing these soils with those of other continents and ascertaining whether the process of nitrate formation is as active as has been assumed. The phenoldisulphonic acid method was used to determine nitrates. Because of the hardness of the soil a pick and shovel were used to cut the soil samples 1 ft. deep and 1½ inches wide.

This is an intensive investigation of the nitrification of the soil nitrogen of 54 South African soils. These were inferior to the nitrification of the soil nitrogen of the 45 humid soils as recorded by Lipman and his associates. The results from a majority of semi-arid soils such as California and Colorado were superior to the author's figures which in turn were higher than the results obtained on Texas soils. It is concluded that nitrification in South African soils is not as intensive as hitherto supposed. However, it seemed adequate for the average crop production in the area of summer rainfall.

Five per cent of the soil nitrogen could be nitrified in 30 days, i.e., indicating a capacity for producing 180 lbs. of nitric nitrogen per acre foot. Although this is a somewhat higher capacity than shown by most of the soils tested, nitric nitrogen was always found on dry land plots, even at the time of the most active growth of maize crops. Dried blood in small quantities more efficiently nitrified than ammonium sulphate, bone meal and dried cowpea hay in the order named. Nitrification in cultivated soils was generally superior to that in virgin soils. No relationship could be established between the efficiency with which soil nitrogen was transformed into nitrates and the organic matter, nitrogen, hygroscopic moisture content of the soil, or the rainfall of the area from which the soil comes. Where the maximum rainfall and temperature coincide, there is a maximum nitrification at the time of greatest crop growth. Thus it appears that there is not much need of nitrogenous fertilizers in the summer rainfall area. On the other hand, farm practice shows that great benefits may be obtained from nitrogenous manures in the Cape areas of winter rainfall, where the optimum conditions of moisture and temperature occur at all times. There appeared to be a perceptible relationship in some cases between the amount of nitrates produced from soil nitrogen and the Veitch lime requirement of the soil. It is interesting to note that the seasonal variation data seem to point to better and more active nitrification at Potchefstroom than at Rothamsted.—N. K.

2110. *Field Tests on the Inoculation of Canning Peas.* E. B. Fred, W. H. Wright and W. C. Frazier. Soil Sc., Balt., 1921, **11**, 479–492.

On Chippawa and Dane County soils of Wisconsin, a study was undertaken of the agents which influence the composition and yield of peas which is of importance from the standpoint of food as well as soil fertility. The soil was analyzed for total nitrogen, before and after growing the crop; and the pea plants also analyzed to measure the effect of peas on the nitrogen supply of soil.

It was found that on a heavy rich clay loam soil slightly acid (which had been cropped to peas for years) inoculation had no effect. However, on a rich acid silt loam soil, inoculation caused an increase in the total yield of pea plants in the yield of peas, per cent nitrogen and gain in nitrogen of residual soil—thus benefiting crop and soil alike.

Similar results were obtained on a heavily manured soil which was neutral in reaction, showing that the benefits of inoculation were not solely confined to acid soils.—N. K.

2111. *The Fixation of Atmospheric Nitrogen By Inoculated Soybeans.* E. B. Fred. Soil Sc., Balt., 1921, **11**, 469–472.

Data are presented to show the amount of nitrogen taken from the air and from the soil when Ito San soybeans are grown with and without bacteria. Likewise the distribution of nitrogen in the various parts of the plant has been studied. Light "blow" sand low in plant food (especially in nitrogen) was used.

"1. The results of this field experiment show that inoculation increased the yield of soybeans 1787 pounds per acre, or more than threefold.

"2. Inoculation resulted in a net gain in nitrogen of approximately 57 lbs. per acre. At the time of harvest, the inoculated soybeans contained 57.10 lbs. of nitrogen in the tops, 2.40 lbs. in the roots, and 5.86 lbs. in the nodules, while the tops of the uninoculated plants, contained only 7.46 lbs, and the roots 0.87 lbs. By far the greater part of the nitrogen of inoculated soybeans, approximately 87 per cent of the total increase of nitrogen is in the tops of the plants.

"3. Aside from the gain in yield, inoculation causes an increase in the per cent of nitrogen in the tops and roots.

"4. Although the entire crop of soybeans, parts above ground, were cut and removed, the after effect of inoculation was clearly shown in the growth of rye the following year. The residue of soybean roots and nodules greatly benefits growth."—N. K.

2112. *Impfung von Feldern mit Bakterien.* (*Field Inoculation with Bacteria.*) Daude. Blätt. f. Zuckerrübend., 1919, **25**, 156–158; **26**, 30–32; 45–47; 176–178. (Centralbl. f. Bakteriol. (etc.), 2. Abt., Ref., 1921, **53**, 408–409.)

The author reviews the species of bacteria which are active in the soil and which are important in the nutrition of plants and in the transformation of nutrients in the soil. Descriptions of some bacteria as well as methods of preparing them in a viable form for fertilizing purposes are given. Methods of cultivation of legume bacteria and of *Bacillus Ellenbachensis* are given. The latter will allow luxuriant growth of grain crops without the addition of nitrogen fertilizer. *Anilitbacillus* isolated from humus soil is described by the author, and it is claimed that its addition to soil will greatly increase the nitrogen content of the soil and crop yield. Preparations were also made of the *B. fluorescens liquefaciens* and *nonliquefaciens* as well as of Radiobacter and Azotobacter groups.

To overcome the soil sickness caused by the various bacterial toxins, sulfite lye in combination with disinfecting substances and nutrient salts will prove a good variable antidote.

The author next discusses the inoculation method of Wenck who, in addition to the cultivation of the corresponding bacteria, strived up to obtain a rational utilization of the by-products of farm industries and of the city waste water. The bacteria are thereby cultivated on the media which are later to be used as fertilizing materials. To make lasting preparations, the reaction has to be made alkaline by the addition of unslaked lime. By adding soluble silicic acid, a dry uninjurious fertilizer powder is obtained.

The reviewer can not share the optimism of the author.—S. A. W.

2113. *Theoretische Hinweise zur Frage der Wirkung einer Bodenimpfung mit freilebenden stickstoff sammelnden Bakterien.* (*Theoretical Considerations on the Question of Soil Inoculation with Non-Symbiotic Nitrogen-Fixing Bacteria.*) Paul Ehrenberg. Fühlings landw. Ztg., 1920, **69**, 161–166. (Centralbl f. Bakteriol. (etc.), 2. Abt., Ref., 1921, **53**, 409–410.)

Two points are brought out by the author in comparing the inoculation of soil with legume bacteria and with cultures of non-symbiotic nitrogen-fixing bacteria. 1. In comparison with the vast number of the various bacteria living in the soil, hardly any change takes place from the inoculation of soil with bacterial preparations. A strong competition takes place, in which the bacteria from the commercial preparations succumb. The legume bacteria have the opportunity to penetrate the roots of the leguminous plants, whereby they are protected from competition with other bacteria. This protection is afforded also when the leguminous plants are dead, since the nodules do not decompose so readily. 2. Soil bacteria fix nitrogen actively in experiments. By inoculating soil with such bacteria, appreciable results should be possible. But the first experiments were accompanied with the artificial addition of expensive substances, like mannite and sugar which is impractical under field conditions.—S. A. W.

2114. Influence de la sterilzation partielle pour la composition de la flore microbienne du sol. (Influence of the Partial Sterilization of Soil on the Microbial Flora.) G. **Truffaut and H. Bezssonoff.** Compt. rend. Acad. de Sc., Par., 1920, **170**, 1278–1279. (Centralbl. f. Bakteriol. (etc.), 2. Abt., Ref., 1921, **54**, 143.)

CaS and aromatic bodies (ortho and meta di-chlor-cresols, for example) gave in 12 hours a decrease of ¾ to ⅘ in bacterial numbers, but, in 8 days, an increase of 6–8 times that of the untreated soil. The soil aeration is of importance. In pots containing 550 gm. soil, the bacterial numbers rose from 19 million to 165 million in 8 days, then dropped to 50 million in 12 days and 20 million in 6 weeks. The numbers of protozoa are decreased, and the N splitting organisms are generally destroyed by the partial steriliziation. The anaerobes are among the most resistant. Before sterilization, *Bac. butyricum* formed 5–10 per cent of the soil flora; after sterilization, 45 per cent. The most common bacteria, after sterilization, are *Bact. mycoides, megatherium, arborescens, Micrococcus ocbraceus, luteus,* to a less extent *Bact. fluorescens liquefaciens.*—S. A. W.

2115. Rôle du manganese en agriculture. Son influence sur quelques microbes du sol. (The Rôle of Manganese in Agriculture. Its Influence on some Soil Microorganisms.) **Dimitrie A. Olaru.** Paris. J. B. Baillères et fils. 1920. (Centralbl. f. Bakteriol. (etc.), 2. Abt., Ref., 1921, **54**, 145–147.)

An exhaustive study of the presence of manganese in nature, its influence as a fertilizing element and its action on soil microorganisms, especially on the fixation of atmospheric nitrogen. The influence of manganese on nitrification, ammonification, growth of *A. niger,* is taken up in detail and an abundant literature is included.

The legume bacteria are very sensitive to manganese, which acts very favorably even in such small amounts as 0.01 mg. in 100 cc. of fluid. The optimum amount is 0.5 mg. (1/200,000) of manganese. The optimum for N-fixation by *Azotobacter chroococcum* is 1–2 mg. in 100 cc. mannite solution, further addition of manganese will diminish the fixation of nitrogen. One part of manganese per million is the optimum for *Clostridium pastorianum.* Ammonification of albuminous substances is also favorably affected. The theoretical and practical importance of manganese as a fertilizer is thereby suggested.—S. A. W.

DAIRY BACTERIOLOGY

(See also Numbers 2096, 2135, 2360)

2116. The Cause of Eyes and Characteristic Flavor in Emmental or Swiss Cheese. **James M. Sherman.** J. Bact., Balt., 1921, **6**, 379–395; Butter, Cheese & Egg J., **12**, No. 41, 24–27; No. 42, 26–30.

Following the modification of the lactate medium of von Freudenrich and Orla-Jensen, it is possible to demonstrate the presence of bacteria which ferment lactate with the production of volatile acids in numbers exceeding one million per gram. The original medium contained both calcium and phosphate ionogens and when these were mutually precipitated from the medium it was left with an acid reaction equivalent to pH 5.2. Substitution of calcium by sodium lactate gives a medium of pH 7.2. An organism which is described here as *Bact. acidi-propionici* (*d*) (following the nomenclature of Orla-Jansen et al.), appears to play the rôle of essential organism for the production of eyes and of the characteristic sweetish flavor of Swiss cheese. It is essentially like the propionic acid bacteria which have been described by earlier workers, differing only in certain characteristics, i.e., producing acid and coagulation in milk, actively fermenting glycerol with the production of considerable quantities of volatile acids, and causing the characteristic sweetish flavor in Emmental cheese. Pure cultures of the organism have been used successfully on commercial scale to insure the proper ripening of Emmental cheese. The plate accompanying the paper pictures cheeses with "eyes," prepared with the essential bacteria; and "blind" cheeses prepared from the same milk without the special inoculum.—I. S. F.

2117. On the Claim that Some Typhoid-Paratyphoid Strains Survive the Milk Pasteurization. **Charles Krumwiede and W. Carey Noble.** J. Infect. Dis., Chicago, 1921, **29**, 310–312.

The authors' summary:

There is no evidence that bacilli of the typhoid-paratyphoid group, even in small numbers, will survive heating to 60°C. for 20 minutes. To insure actual heating of all the sample and to exclude other sources of error in laboratory pasteurization tests, the sample container should be completely submerged in the bath.—L. C. H.

2118. Propagation and Control of Pure Cultures. **Peter Peterson.** Milk Dealer, 1921, **2**, No. 1, 22–24.

The author outlines in general the cultural and in particular the temperature relationships of the "lactic ferment" which he classifies into the coccus types and the group which possesses great keeping quality, and bulgaricus cultures.

Special methods for the propagation of these cultures in a patented oven are described. A suitable quantity of milk, of selected quality, is placed in a closed container and the container submerged in a heated fluid to a temperature of 88°C. on 3 successive days, cooling after each heating to 20°C. After the heating and cooling procedure on the third day the culture is added to the milk thus treated and preserved at a temperature of 10°C.—G. J. H.

2119. Volatile Acid Production of S. lacticus and the Organisms Associated with it in Starters B. W. Hammer. Iowa Agric. Exp. Sta., Ames, Research Bull. 63, 1920, 59–96c.

This is a continuation of studies already noted (Abs. Bact., 4, Abs. No. 947, 1920) in which further evidence is reported to show that ordinary butter starters are a mixture of organisms, the predominant organism, *S. lacticus*, being associated with two similar organisms which are given the names *S. citrovorus* and *S. paracitrovorus* by the author. Descriptions of these two new species are included. One of the most marked differences between these two new species is the fact that *S. citrovorus* did not grow at 37°C. on any medium tried, while *S. paracitrovorus* grew at 37°C. on suitable agar media. Neither organism grows on beef extract media, but both grow on whey agar and beef infusion agar. In contrast to *S. lacticus* both of these organisms produce volatile acids from the citric acid normally present in milk, and in one case at least from the lactic acid produced by *S. lacticus*. The historical development of the use of starters and of the idea that more than one organism is present in good butter starters is given.—R. S. B.

2120. The Type of Lactic Acid Produced by Starters and by the Organisms Isolated from Them. B. W. Hammer. Iowa Agric. Exp. Sta., Ames, Research Bull. 65, 1920, 115–128.

Work done by the author and by other investigators has been in general agreement that the type of acid produced by *S. lacticus* in its fermentation of milk is *d* lactic acid. Tests were therefore made to determine the type of acid present in typical starters. These showed that they contained some inactive lactic acid, thereby indicating that they were not pure cultures of *S. lacticus*. With mixtures of *S. lacticus* and the organisms described in a Bull. 63 (see Abs. No. 2119) some inactive acid was also present as in the natural starters. An analysis of the data suggests that the associated organisms of both types may be able to change *d* lactic acid to the *l* form.—R. S. B.

2121. Type of Lactic Acid Produced by Starters and by the Organisms Isolated from Them. B. W. Hammer. Creamery & Milk Plant Month., 1921, **10**, No. 8, 24.

This article has been previously reported from another source. See abstract No. 1901. —G. J. H.

2122. A Study of Brown Glass Milk Bottles with Special Reference to their Use in Preventing Abnormal Flavors Due to Light. B. W. Hammer and W. A. Cordes. Creamery & Milk Plant Month., 1921, **10**, No. 8. 23–24.

This article has been previously abstracted from another source. See abstract No. 1900. —G. J. H.

2123. Vergleichende Prüfungen bakteriologsicher und biolchemischer Methoden zur Beurteilung der Milch. (Comparative Tests of Bacteriological and Biochemical Methods for Judgment of Milk.) Willy Borck. Centralbl. f. Bakteriol. (etc.), 2. Abt., Ref., 1921, **54**, 127–129.

This is a continuation of the work of O. Schroeter on the market milk of Leipsig. The numbers of bacteria in the milk were determined both by the plate and direct counting methods. It was found that the milk, on standing 6–9 hours at room temperature (25°C.), showed an average increase of bacteria per cubic centimeter of milk, from 7 to 860 millions, or 120 times; pasteurized milk gave an increase from 520,000 to an average of 53,500,000 cells or about 100 times. Milk agar was superior over Ragit-agar in 11 cases, in 30 cases the latter proved superior and, in 19 cases, they gave like results. Out of 35 tests, the microscopic count gave, in 16 cases, the same results as the plate count, in 6 cases lower, in 13 higher results. A review of the biochemical methods is given. The original abstract should be consulted for details.—S. A. W.

2124. Bakteriologische Untersuchungen des gewöhnlichen bulgarischen Käse. (Bacteriological Investigations of the Common Bulgarian Cheese.) W. Markoff. Centralbl. f. Bakteriol. (etc.), 2. Abt., Ref., 1921, **54**, 132.

The numbers of microorganisms found in sheep milk and its products are given in tables.—S. A. W.

2125. Pozorování o působení některých uchovacích prostředků v mléce. (Observations on the Influence of Some Milk Preservatives.) J. Proks. Zprávy laktolog. čes ůstavu českého vysokého učeni tech. v. Praze. Praze 1920. XII, 8°. 40 pp. (Centralbl. f. Bakteriol. (etc.), 2. Abt., Ref., **54**, 129–131.)

The preservative action of sodium bicarbonate, sodium benzoate, "microbine," (i.e., sodium p-chlorphenate), sodium silicate, formic acid and mustard extract upon milk was studied. In the first part of the work 1–10 parts per 1000 were used, in the second part 1–2 per 1000, except the mustard extract (0.01–0.02 per 1000). The sodium bicarbonate causes a decrease in the number of lactic acid bacteria, but not of the peptonizing forms, the same is true even to a greater extent of the benzoate of soda. Microbine was still more efficient. Formic acid, 0.115 gm. per liter, had no antiseptic action on the milk. Next to microbine, sodium salicylate and mustard extract were the most efficient, the first two weakening greatly the activities of the lactic acid bacteria, to a lesser extent of the peptonizing bacteria, particularly in doses above 2 gm. per liter. The molds are very resistant to the action of the preservatives. The preservatives, due to their weak action on the peptonizing bacteria, cannot be used either in commercial milk, neither can they be used in industrial milk, due to the fact that the alcohol formation is little retarded. The preservatives are of value only for use in homes.—S. A. W.

COMPARATIVE PATHOLOGY

(*See also Numbers 2159, 2161, 2162, 2171, 2176, 2343*)

2126. La peste des "Géorgiques" de Virgile. (*The Plague of Virgil's Georgics.*) FERNAND ARLOING AND RAYMOND BILLIARD. Bull. Soc. centr. de méd. vét., Par., 1921, 97, 105–109.

Attention is called to the very forceful description by the early Latin poet of a disease or diseases of all species of animals of a very explosive epizootic nature. The disease was probably anthrax although it might have included several diseases in the respective animals. The following are suggested: calf diarrhea, pneumoenteritis of swine, rabies or canine typhus, or one of the pastuerelloses.—W. G.

2127. B. botulinus (Type A) Associated with Fatal Pasture Disease of Horses. ROBERT GRAHAM AND HERMAN R. SCHWARZE. J. Infect. Dis., Chicago, **29**, 114–119.

It seems probable that many cases of toxemic-like diseases in domestic animals may be due to botulism. In such vicinities the harvested grain, ensilage, garbage, etc., were found to be contaminated with *B. botulinus*. The fact that this organism is an anaerobe does not preclude it as an etiologic agent or exclude forage as a source of infection, since this bacillus will grow exposed to the air in symbiosis with *B. subtilis*. The authors report cases coming under their observation in which *B. botulinus* was isolated from the organs and from the feed which had been used.—L. C. H.

2128. Horse Pox and Coital Exanthema. J. F. CRAIG AND D. KEHOE. J. Comp. Path. & Therap., Edinb. & Lond., 1921, **34**, 126–129.

In the outbreak described 1 stallion and 6 mares were affected. The animals were all thoroughbreds. Facts suggest that the disease was brought in by one of the mares. Symptoms in the mares were confined to the genital organs. Lesions appeared on the skin at the outer side and margin of the vulva and in 3 instances on the skin of the inside of the thigh. Small flat nodules or vesicles the size of a pin-head to a split pea first appeared. In some cases they fused and became irregular. The vesicles soon changed to pustules becoming yellow and opaque, these ruptured in a day or two and exuded a yellow sticky pus. The scab was soon cast off. The sore was superficial with the base depressed and red or covered with a yellow film. Upon healing the place of the sore was marked by a white spot.

In the stallion the small nodules on the penis and the inner side of the sheath gave way to red, depressed sores similar to those seen in the mares. Lesions appeared on the lips, inner side of the cheek, under aspect of the tongue and over one eye. These lesions appeared similar to those of contagious pustular stomatitis. A pony in the same stable as the stallion showed the same lesions. Inoculation of a heifer with pustular material gave negative results. The lesions of contagious pustular stomatitis in the stallion and the pony were identical with those on the penis and vulva and as contagious pustular stomatitis is identical with horse pox there is little doubt that the genital lesions were of the same nature.—C. E. H.

2129. Beiträge zur Spezifitätsfrage der Klomplementbindungsmethode bei der Rotzkrankheit. (*A Contribution to the Question of the Specificity of the Complement Fixation Method in Glanders.*) FONTAINE AND LÜTJE. Ztschr. f. Veterinärk., Berl., 1919, **31**, 1.

An extensive investigation of the complement binding properties of the blood of both glandered and non-glandered army horses.

Besides a number of mallei extracts, the antigens used were as follows: abortus extract; non-specific extract; pyocyaneus extract; proteus extract; lues extract; streptococcus extract; staphylococcus extract; paratyphosus B extract; suipestifer extract.

The non-glandered animals were of 2 classes, the normal and the ones affected with other diseases, of which a great variety was represented.

The results showed the complement fixation test in glanders to be absolutely specific. In no case was fixation obtained with glanders extract in normal or diseased non-glanderous horses. Further, no fixation was obtained with any of the other extracts in glandered horses.—W. A. H.

2130. Sur la vaccinothérapie de la lymphangite épizootique. (*Vaccine Therapy of Epizootic Lymphangitis.*) A. BOQUET AND L. NÈGRE. Bull. Soc. centr. de méd. vét., Par., 1921, **97**, 53–56.

The anticryptoccic vaccine consisted of an emulsion of the cryptococcus in distilled water, 5 mg. per cc. and 0.5 per cent phenol heated to 65°C. for 1½ hours. Kept from light and heat it was active for more than 6 months. The injections were made every 7 days subcutaneously on the neck in increasing doses from 1 to 5 cc. The effects of the treatment are discussed. The results were favorable except in advanced cases.—W. G.

2131. Über die Herstellung von flüssigem Mallein, nebst einigen Bermerkungen über die Augenprobe. (The Manufacture of Fluid Mallein, with Some Remarks on the Eye-Test.) C. Troester. Ztschr. f. Veterinärk., Berl., 1916, **28**, 33.

Mallein is prepared by growing the glanders bacillus on faintly alkaline bouillon containing 4½ per cent glycerin in 10-liter flasks, 7 liters of the medium being placed in each flask. In order to encourage surface growth, the inoculum is floated on small pieces of glass. The flasks are incubated at 38°C. for 2 to 3 weeks when the surface is covered with a thick layer of glanders bacilli.

The purity of the cultures is determined by the gross appearance of the growth, and by the odor, both of which are quite characteristic. Microscopic examination for this purpose is worthless because old cultures do not show characteristic morphology. If in doubt, subcultures may be made on slanted agar and these examined for purity after several days' incubation.

The flasks of pure culture are heated to the boiling point to kill the bacteria and then the contents poured into large evaporating dishes of a capacity of 15 liters in which the fluid is concentrated to about one tenth of its original volume. This process requires about 24 hours. The product remaining is termed "crude mallein."

Crude mallein is a dark brown, very turbid fluid which is customarily cleared by filtration. This is a very laborious and slow procedure and generally results in the loss of considerable fluid. Since ophthalmic mallein need not be absolutely clear, the filtration is done away with and clarification accomplished by sedimentation and centrifugalization.

The finished fluid mallein is a slightly turbid fluid of a sweetish-salt taste and characteristic odor. Because of its high glycerin content, it is proof against bacterial action but molds will develop in it readily. Research has shown, however, that mold growth does not destroy its efficiency. A fluid mallein 3 years old and with a mold growth on the surface as thick as a finger proved as efficient as a fresh product.

The methods of conducting the eye-test in vogue are criticized. Examination of the instilled eye should be begun as early as 4 hours after instillation. In some cases the purulent discharge may have entirely disappeared by the twelfth hour.

Miessner, in his book "Kriegstierseuchen und ihre Bekampfung" claims that false mallein eye reactions sometimes occur, probably as a result of irritating substances in the mallein from contamination by extraneous organisms. This is not possible in mallein prepared as described.—W. A. H.

2132. Étude expérimentale de l'immunisation contre le bacille de la nécrose. (An Experimental Study of Immunization against the Necrosis Bacillus.) E. Césari. Bull. Soc. centr. de méd. vét., Par., 1921, **97**, 80–89.

Experiments were conducted with the necrosis bacillus with both guinea pigs and rabbits with a view to the production of both active and passive immunity. In the various experiments there were used both heated and unheated, (a) the germfree culture or toxin, (b) the washed bacteria (toxin-free), and (c) the whole culture (bacteria and toxin). Injections were made both subcutaneously and intravenously. With the guinea pig it was easy to render the animal refractory to the toxin but not to the bacteria. Active antimicrobial immunity was not produced in rabbits but a strong antitoxic immunity was produced.—W. G.

2133. The Relation of the Corpus Luteum to Estrum and the Involution of the Pathologic Uterus. W. L. Boyd. J. Am. Vet. M. Ass., Wash., 1921, **60**, 34–45.

The writer discusses rather fully the histology and physiology of the corpus luteum. The removal of the corpus luteum in the early stages of pregnancy causes the expulsion of the embryo or fetus in a few days. A persistent or retained corpus luteum is one of the causes for failure to come in heat. Experience shows that animals which are sterile due to the presence of a persistent corpus luteum respond readily to treatment. The dislodgment of a retained corpus luteum is also of great value in the treatment of pyometra. Several cases are cited. In cases of mummified or desiccated fetus, the removal of the corpus luteum will in most cases cause the expulsion of the uterine contents within 3 to 10 days.—W. A. B.

2134. Preparation of Tuberculin and Theory of Tuberculin Reaction. M. Scherago. Vet. Med., Chicago, 1921, **16**, 28–30.

The preparation of tuberculin is described in detail. A reaction to the tuberculin test is described as anaphylaxis. The writer defines anaphylaxis as a variety of immunity. It is pointed out that in advanced generalized tuberculosis no reaction occurs, because the enzymes are all used in decomposing the large amount of tuberculous protein constantly present in the blood. The fact that an animal which has once reacted fails to again react until after several months, depends upon the fact that the excess enzyme is used in the reaction and time must elapse for a further excess to accumulate.—W. L. B.

2135. A Theory as to the Cause of Milk Fever. C. H. Darlington. J. Am. Vet. M. Ass., Wash., 1921, **59**, 595–597.

The author believes that it is the multiplication of anaerobic bacteria in the udder and the elaboration by them of a toxin which when absorbed produces the symptom complex known as milk fever. The recovery of the animal after the udder is inflated with air is advanced as evidence that the further growth of the organism is stopped.—W. A. B.

2136. *Esporo-vacunas anticarbunclosas.* (*Anti-Anthrax Spore Vaccines.*) S. DESSY. Rev. Sud-Americana, Buenos Aires, 1920, **3**, 33–36.

From his experience in injecting 200,000 cattle the author prefers the spore vaccine. If it is necessary to use the double vaccine there should be an interval of at least 25 to 30 days between the first and second injections in order to avoid sensitization.—G. H. R.

2137. *Anaphylactic Reactions Resulting from Vaccination against Anthrax by the Serum-Simultaneous Method.* W. J. TAYLOR AND F. L. CASSERLY. J. Am. Vet. M. Ass., Wash., 1921, **59**, 704–710.

The author presents data and tables from which the following conclusions are drawn. Anaphylactic reactions are likely to occur in cattle vaccinated by the serum-simultaneous method. There is at present no means of determining which animals will or will not react. A sensitizing dose of 1 cc. of serum 2 hours before the regular vaccination may reduce the reaction. This reaction is not accompanied by a rise in temperature. Usually the reacting animals require no treatment. It is possible that this reaction may produce an abortion in the pregnant animal.—W. A. B.

2138. *Les accidents, les échecs et les faux échecs de vaccination, principalement en pathologie exotique.* (*The Accidents, Failures, and Pseudo-Failures of Vaccination, especially in Pathology of Foreign Countries.*) JULES BLIER. Rec. de méd. vét., Par., 1921, **97**, 80–114.

The study was undertaken in order to classify the unfortunate phenomena which follow vaccinations and to examine, especially in pathology of foreign countries, the methods opposed to the failures in question. The subject is discussed at length under three headings: (a) failures immediately following the injection of the immunizing antigen (vaccination accidents); (b) failures remote from the time of injection of the antigen (vaccination failures); (c) failures which are unjustly attributed to the injection of the antigen (pseudo-failures of vaccination). Numerous references to the literature are given.—W. G.

2139. *Les lésions cutanées dans la peste bovine et le rôle des peaux dans la transmission de la maladie.* (*The Cutaneous Lesions in Cattle Plague and the Rôle of the Skin in the Transmission of the Disease.*) G. CURASSON. Rec. de méd. vét., Par., 1921, **97**, 19–26.

There is given a description of the cutaneous manifestations of the disease. By proper use of disinfectants the danger of spread of the disease from the skin lesions may be avoided.—W. G.

2140. *Fiebre aftosa.* (*Aphthous Fever or Foot-and-Mouth Disease.*) JOSE MARIA FONTELA V. Rev. zootec., Buenos Aires, 1921, **8**, 231–250.

An extensive article on foot-and-mouth disease. The introduction describes some of the preventive and curative treatments, including prophylaxis, abbreviation of the disease, use of venous blood, hydrotherapy, pharmacotherapy, chemiotherapy, bacteriotherapy, vaccine-therapy, serotherapy, and immunotherapy. Part I details the pharmacological agents and treatments, Part II the biological agents and treatments. In conclusion, suggestions are made for the prevention and cure of the disease.—H. M.

2141. *Cual es la situacion actual en lo que se refiere a peste bovina?* (*What Is the Actual Situation in that which Is Referred to as Bovine Plague?*) JOSÉ LIGNIÈRES. Rev. zootec., Buenos Aires, 1921, **8**, 229–230.

A discussion of the conditions existing in Brazil and the Argentine as regards bovine plague.—H. M.

2142. *Note sur une nouvelle inoculation préventive contre la peste bovine.* (*Note on a New Preventive Inoculation against Cattle Plague.*) GORDZIAKLOWSKI. Rec. de méd. vét., Par., 1921, **97**, 115–116.

The author experimented with the blood of the sick animal in the absence of a culture of the causative microbe. The blood was drawn from the jugular vein during the second stage of the disease, defibrinated and heated at 55°C. for 10 minutes and then at 48–50°C. for 1 hour. Encouraging results followed the use of the vaccine.—W. G.

2143. *Results from Immunizing Cattle against Abortion.* F. B. HADLEY. J. Am. Vet. M. Ass., Wash., 1921, **60**, 26–33.

The writer has collected data from the treatment of 474 cows and heifers. Of the treated animals 14.1 per cent aborted while of the 101 control animals 31.2 per cent aborted. Thus the abortion rate was twice as great in the unvaccinated animals. It is believed that the vaccinated animals also show an increase in breeding efficiency. In the group of open cows that had never aborted the vaccine was 91.8 per cent efficient. It was found to be of little value in open cows that had aborted previous to treatment. The writer warns against undue optimism but believes that the results of the Wisconsin experiments show that the treatment has considerable value.—W. A. B.

2144. *Researches Regarding Epizootic Abortion of Cattle.* JOHN M'FADYEAN. J. Comp. Path. & Therap., Edinb. & Lond., 1921, **34**, 105–126.

The blood of animals in herds numbered 2 to 6 inclusive was tested for evidence of abortion. The animals giving a proper reaction were isolated and epizootic abortion was eliminated from these herds.—C. E. H.

2145. Fat Necrosis in Cattle. W. A. HAGAN. J. Am. Vet. M. Ass., Wash., 1921, **59**, 682–688.

Fat necrosis is practically always found in the abdominal cavity. The mesenteric fat is most commonly affected in cattle. When the lesions are located in the lymph nodes, they may be confused with tuberculosis. The pancreas is not usually affected. Case reports and cuts are included.—W. A. B.

2146. Experimental Treatment of Cattle to Prevent Ox Warble Infestation. MARION IMES AND F. L. SCHNEIDER. J. Am. Vet. M. Ass., Wash., 1921, **59**, 722–727.

Experimental data are given from which it is found that a 2 per cent solution of coal-tar creosote dip was the most effective. Further use may prove that the wading tank is of great practical value. Results also indicate that cattle which have their legs protected from below the knees and hocks by the application of insecticidal or fly repellant substances during the fly season, have few if any grubs during the following winter.—W. A. B.

2147. Bacillary Dysentery in Lambs. S. H. GAIGER AND THOS. DALLING. J. Comp. Path. & Therap., Edinb. & Lond., 1921, **34**, 79–105.

Lamb dysentery is a serious menace to sheep raising. It is annually spreading north in Scotland and farther south in England and does not show signs of abatement until it has existed on a given farm for 7 or 8 years. The mortality is at least 30 per cent and occurs mostly during the first 2 weeks of life. Lambs over 15 or 18 days old are immune. The disease is caused by a bacillus of the coli type. Invasion into the body is through the inflamed bowel. The lesions are inflammation and necrotic ulceration of the intestines. The ewe, according to the evidence, acts as carrier of the bacillus and carries infection from season to season on the same farm and to other farms.

A preventive serum used on lambs on the day of birth immunized them for a short time but did not protect them long enough to carry them over the susceptible period. Further tests in immunization are to be carried out. It is suggested that proper precautions and alteration of some of the customs followed during lambing time might minimise the losses.—C. E. H.

2148. Studies on the Sheep Stomach Worm—Haemonchus controtus Rud. J. E. GUBBERLET. J. Am. Vet. M. Ass., Wash., 1921, **59**, 716–721.

The life history of this parasite is given briefly, together with the method of treatment of infested sheep. A solution of 1 per cent copper sulphate and 1 per cent tobacco infusion was found to be from 90–100 per cent efficient. The use of tobacco was found of value in the removal of tapeworms and hookworms. The treatment should be used twice, a few days apart. Sodium cacodylate was used with negative results. It is stated that the number of stomach worms can be estimated by the number of eggs in one gram of the droppings.—W. A. B.

2149. The Prevention of Intestinal Worms in Pigs. B. H. RANSOM. J. Am. Vet. M. Ass., Wash., 1921, **59**, 711–715.

The author outlined a method of prevention which was used by the United States Bureau of Animal Industry in McLean County, Illinois. The system consists in the handling of young pigs from the time of birth until they are several months old entirely away from the old hog lots or other places that have been exposed to fecal contamination. This method has been used very successfully in Illinois and many other places.—W. A. B.

2150. Common Nervous Diseases of the Dog. G. H. LIVESEY. Vet. Med., Chicago, 1921, **16**, 28–34–72.

Many of the common ailments of the dog are of a nervous origin. They are classified as neuroses, and if neglected may give rise to sequellae which may develop into definite illnesses. The various conditions are described: (*a*) excitability due to skin irritation; (*b*) epileptiform convulsions; (*c*) convulsions a sequel to distemper; (*d*) convulsions due to digestive derangement; (*e*) convulsions from excitement; (*f*) convulsions due to metritis; (*g*) convulsions due to eclampsia, nephritis etc.; (*h*) rheumatism or meningitis; (*i*) tuberculosis, parasitism, chorea and coma.—W. L. B.

2151. Una nueva enfermedad de los gatos? (*A New Disease of Cats?*) C. LERENA. Rev. zootec., Buenos Aires, 1921, **8**, 256–257.

A report is made of several cases of an unknown disease of cats, including prodromes, and symptoms. Treatment is suggested.—H. M.

2152. Piobacillosi spontaneo nei conigli. (*Spontaneous Pyobacillosis in Rabbits.*) SURGI COMINOTTI. Clin. vet., Milano, 1921, **44**, 45–60.

After reviewing the literature, the author discusses the two epidemics occurring among the rabbits of two large breeding establishments. In both instances, there was observed a disease "of enzootic character and chronic form characterized by the appearance of abscesses which establish themselves in the subcutaneous connective tissue of various parts of the body. The causative agent of this disease is a variety of *Bacterium pyogenes*, *Bact. pyogenes cunicula*." The morphology, cultural characteristics and pathogenic properties of this organism are described in detail.—F. W. T.

2153. *Further Observations on "Blackhead" in Turkeys.* **Ernest Edward Tyzzer, Marshal Fabyan and Nathan C. Foot.** J. Infect. Dis., Chicago, 1921, **29**, 268–286.

Further experiments and observations on the spread and method of infection of turkeys with the virus of blackhead are described. It was found that freezing quickly killed the virus but that it lives longer at temperatures just above 0°C. than at room temperature.

Subcutaneous inoculation, in the authors' experience, is more successful than the intravenous route, for some unknown reason. Immunity has nothing to do with this phenomenon as turkeys which failed to become infected when inoculated intravenously developed the infection when subsequently injected subcutaneously. Immunity probably follows an attack of the disease. Some of the acquired immunity of old turkeys may be due to slight attacks in the past.

Emetin treatment, suggested by its successful use in human amebiasis, was unsuccessful in the authors' hands. It seems apparent that some pathological condition is necessary for blackhead infection, such as that which may be produced by infestation with the roundworm, *Heterakis papillosa* common among turkeys, and when the intestinal mucosa is thus damaged, infection with the *Histomonas* can occur. Inoculation of turkey embryos failed to produce the disease and exposure to turkey droppings of the previous year also failed.—L. C. H.

2154. *Studies on the Use of Anthelmintics in Fowls.* **A. B. Wickwire.** J. Am. Vet. M. Ass., Wash., 1921, **59**, 731–740.

The author presents considerable experimental data from which is concluded that pomegranate bark, areca nut, thymol, and fluid extract of male fern are of very little value as taenacides in fowls.—W. A. B.

PARASITIC DISEASES

2155. *Meningite spinale a Cysticerques.* (*Spinal Meningitis Caused by the Cysticercus.*) **T. Vasiliu.** Presse méd., Par., 1921, **29**, 522–523.

The author observed a fatal case of lepto-meningitis caused by *Cysticercus*. Histologically, there was thrombosis of the small blood vessels, with periarteritis and endarteritis.—L. A. K.

TROPICAL DISEASES

2156. *Expedicion al Africa y estudios de fiebre amarilla.* (*Expedition to Africa and the Study of Yellow Fever.*) **J. Guiteras.** San. y benefic. Bol. ofic., Havana, 1921, **25**, 21–33.

By a study of the death rate of children under 5 years of age the author is able to detect the presence of yellow fever in a community. The problem of yellow fever in Africa is studied in comparison with the same problem in the Western Hemisphere. The author discusses ten points upon which Noguchi has not clearly demonstrated the etiological relation of *Leptospira icteroides*.—G. H. R.

MEDICAL ENTOMOLOGY

2157. *Blausäure Derivate zur Schädlingsbekämpfung.* (*Cyanogen Derivatives Against Vermin.*) **Ferdinand Flury and Albrecht Hase.** München. med. Wchnschr., 1920, **67**, 779–780.

Methyl cyanoformic acid ($CNCOOCH_3$) is recommended as a substitute for HCN against vermin. Its vapors are highly irritating and destructive.—B. C.

PROTOZOOLOGY

2158. *The Development of the Female Phase of the Leucocytozoon syphilidis.* **J. E. R. McDonagh.** J. Path. & Bacteriol., Edinb., 1921, **24**, 272–276.

A detailed description is given of the changes, movements and staining properties of the female gametocyte preceding, during and following fertilization by the spirochaeta. The organism was studied *in vivo* stained with borax-methylene blue, and in sections stained with pyronin and methyl-green.—I. W. P.

2159. *A Protozoan Parasite in the Salivary Gland of the Dog.* **Leila Jackson.** J. Infect. Dis., Chicago, 1921, **29**, 302–305.

A parasite found in the salivary glands of 2 dogs in the course of examinations for rabies is described. It probably belongs to the class *Telosporidia*, group 2, *Coccidia* and family 4, Polysporcystidae.—L. C. H.

ANIMAL PARASITES

(*See also Numbers, 2148, 2149, 2154*)

2160. *Observations on the Life History of Ascaris lumbricoides.* **B. H. Ransom and W. D. Foster.** U. S. Dept. Agr. Bull. 817.

The authors demonstrate that infestation of the common hosts, man and swine, results from ingestion of the egg; that the larvae undergo the same sort of migration that they do in rats and mice; that instead of finally leaving the body in feces the larvae, after migrating through the lungs, establish themselves in the small intestine and develop to maturity. About 2½ months is the period required for the worms to become mature after the eggs are swallowed. The failure of the parasites to establish themselves in the intestine after migration through the lungs in rats, mice, guinea pigs, rabbits, etc., is an expression of imperfect adaptation of the parasites to these hosts. In the more susceptible animals, goats and sheep, the parasites may establish themselves in the intestine and survive for some time, 3 months at least, and approach but never reach fertile maturity. Undoubtedly many of the cases of so-called "thumps" in young pigs are due to *Ascaris* larvae.—C. E. M.

2161. The Eggs of the Nematodirus Worms of Sheep. Howard Crawley. Vet. Med., Chicago, 1921, **16**, 25–28.

The author describes observations on two different lots of nematodirus worms. The average dimensions, and the maximum and minimum length and breadth of the eggs measured, are tabulated. It was impossible to measure all of the eggs present; the average number did not exceed thirty. Two important points were noted. First, the average size of all the eggs measured is not the same as the average of the maximum and minimum figures. This was true of both lots and demonstrated that the average size should always be based on measurements of a considerable number of eggs. In the second place a variation was noted in the average size of the eggs from the different worms. The eggs of the nematodirus are readily differentiated from those of all other nematodes which infest sheep.—W. L. B.

2162. Hookworm Disease in Dogs. W. Reid Blair. Vet. Med., Chicago, 1921, **16**, 25–27.

The disease is very prevalent in the vicinity of New York City and is thought to be increasing in certain breeds of kennel dogs, particularly fox hounds and German sheepdogs. The pathological changes consist mainly of anemia, emaciation, with edema and softening of the lymph glands. The medicinal as well as preventive treatment is described.—W. L. B.

2163. Die Vertilgung der Pediculi pubis. (*The Eradication of Pediculi pubis.*) Leo Dub. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 48.

Hebra's lead-containing diachylon salve has been found to kill the lice and their eggs.—B. C.

EPIDEMIOLOGY

2164. La epidemia de gripe en la isla de cuba y mas particularmente en la Habana. (*The Epidemic of Influenza in the Island of Cuba and Particularly in Havana.*) J. L.-P. Cassa. San. y benefic. Bol. ofic., Havana, 1921, **25**, 44–69.

The treatment of this subject is from a statistical point of view, no laboratory investigations being included.—G. H. R.

DISINFECTION AND GROWTH INHIBITION

(*See also Number 2125*)

2165. Semmelweiss, der Begründer der Anti- und Aseptik. (*Semmelweiss, the Founder of Anti- and Asepsis.*) Franz Bruck. München. med. Wchnschr., 1920, **67**, 755–756.

The author points out that Philipp Semmelweiss preceded Lister by 20 years in efforts to introduce antisepsis in surgical practice in Germany. Quotations are given from Semmelweiss' book published in 1861 which show that the writer was aware of the mode of spread of hospital and childbed infections, even though at that time the causative organisms were unknown.—B. C.

2166. Standardization of Disinfectants with Particular Reference to the Chemical Sterilization of Water. S. R. Christophus, K. R. Tyengar and W. F. Harvey. Indian J. M. Research, Calcutta, 1920; Eng. Contrg., 1921, **55**, 637–638.

Comparisons are usually made by the Rideal-Walker test. Comparison with a standard disinfectant such as 1–100 carbolic acid is common. Tests were made on iodine as a substitute. Using a standard broth, a fixed quantity of *B. typhosus* or *B. coli* was added. The absorption of I and Cl by bacterial substances was studied. Iodine proved a better indicator.—L. P.

WATER AND SEWAGE BACTERIOLOGY

(*See also Number 2166*)

2167. Algunas consideraciones sobre analisis bacteriologicos de aguas. (*Some Remarks on the Bacteriological Examination of Water.*) A. Vieta. San. y benefic. Bol. ofic., Havana, 1921, **25**, 239–245.

The author concludes that it is necessary to study the local conditions in order to control the sanitary quality of water. He recommends several points in regard to the establishment of laboratories and legal control.—G. H. R.

FOOD BACTERIOLOGY

2168. *An Investigation Into the Purity of American Strains of Bacillus botulinus.* **George F. Reddish.** J. Infect. Dis., Chicago, 1921, **29**, 120–131.

B. sporogenes was found as a contaminant in all but one of 19 strains obtained by the author from different laboratories in this country. This may explain the differences in the descriptions of *B. botulinus* made in the U. S. and by European investigators. The use of such impure cultures in the making of antitoxin is unsatisfactory and may account for the unsatisfactory results in treatment.—L. C. H.

2169. *Changes in the Human Central Nervous System in Botulism.* **C. B. Semerak.** J. Infect. Dis., Chicago, 1921, **29**, 190–199.

The pathology of a fatal case of human botulism is described in detail. It is concluded that the changes are confined to the vascular system. Thrombosis of arteries and veins is the initial change, followed by ischemic necrosis and later by inflammation. The toxin has no direct action on nerve cells, the retrogressive changes are secondary and due to the disturbed blood supply. The ganglion cells of the motor cranial nerves are always involved because their blood supply is derived from terminals of branches of the vertebral arteries which seem to be the seat of predilection of the thrombosis.—L. C. H.

2170. *A Rapid Method of Determining the Presence and Type of Botulinus Toxin in Contaminated Foods.* **Paul F. Orr.** J. Infect. Dis., Chicago, 1921, **29**, 287–290.

The fact that intraperitoneal inoculation of mice with botulinus toxin results in rapid death, has been utilized by Orr to test suspected food for the presence of this toxin. By using control mice injected with antitoxin of each type, the type can also be determined.—L. C. H.

2171. *The Laboratory Diagnosis of Botulism.* **C. E. Salsbery.** J. Am. Vet. M. Ass., Wash., 1921, **59**, 592–594.

The author points out the difficulties which often make a laboratory diagnosis impossible. It is believed that a diagnosis is best made from the symptoms which are outlined. Negative bacteriological findings are not conclusive. A physical examination of the feed is not a sure indication of botulinus poisoning. Mouldy feed without the presence of *B. botulinus* is not toxic to domestic animals.—W. A. B.

2172. *Public Health Studies Concerning Cheese.* **E. C. Schroeder and G. W. Brett.** Creamery & Milk Plant Month., 1921, **8**, 21–23.

This article has been previously reported from another source. See abstract No. 1308. Vol. 4.—G. J. H.

DIATHETIC AND DEFICIENCY DISEASES—VITAMINES

2173. *The Effect on the Guinea Pig of Deprivation of Vitamin A and of the Antiscorbutic Factor, with Special Reference to the Condition of the Costochondral Junctions of the Ribs.* **Frances M. Tozer.** J. Path. & Bacteriol., Edinb., 1921, **24**, 306–325.

The following experiments were undertaken in an effort to determine the difference in the effect on guinea pigs of diets deficient in vitamine A and in antiscorbutic. The experiments were for the most part started with young growing animals of 290–350 grams weight. The basal diet consisted of oats and bran, from which the supply of antineuritic ("water-soluble B") was obtained. The antiscorbutic used was orange juice and vitamine A was supplied in the form of milk autoclaved for one hour at 120°C. to destroy its antiscorbutic properties. The desired doses of antiscorbutic and vitamine A were administered, when necessary with a pipette.

Longitudinal sections from 2 or more ribs of each animal were examined, the most normal and the most abnormal looking one being chosen for this purpose. The material was fixed in 10 per cent formalin, decalcified and stained with hematoxylin followed by a mixture of one part of rubin S to two parts of orange G. The following results were obtained.

A. Experimental Control. It was found that guinea pigs remained perfectly normal when fed on the basal diet of oats and bran, *ad lib.*, plus 10 cc. of orange juice and an average of 70 cc. of autoclaved milk daily. They gained in weight during life, and microscopic examination of the costochondral junction after death showed nothing abnormal.

B. Effect of Deprivation of Antiscorbutic. During the first 14 days the animals remained healthy, except for occasional soreness of the knee or shoulder. Thereafter soreness progressed and activity decreased. Between the 23rd and 30th days the animals became seriously ill, with loose teeth and staring coat and constant evidences of pain. They continued to fail, losing weight steadily, and death occurred about the 30–35th day. Animals killed at 10–14 days showed only slight ridges at the costochondral junction, but at 17–18 days the bones were fragile and showed hemorrhages, with more or less swollen rib junctions. Toward the end the teeth became very loose, the rib junctions swollen and deformed and the bones brittle. Microscopically the costochondral junction was found to be disorganized, the rows of cartilage cells had lost their alignment, the trabeculi were shortened and the bone was frequently fractured on both sides of the junction, giving an appearance suggesting that the cartilage had telescoped into the marrow cavity. There was usually hemorrhage about the fracture, and into the marrow cavity and the surrounding muscles, varying amounts of fibrous tissue being found in the marrow cavity. Such a condition is described as "acute" or "severe."

C. Effect of Deprivation of Vitamine A. There were no symptoms of illness under 21 days, animals killed at 10-14 days showing nothing abnormal except that the bones were slightly fragile and there were minute ridges on the rib junctions. Animals in this period were healthy, showing no soreness, as in scurvy, but not growing. Later, except for extreme emaciation and increased liability to intercurrent disease, there were no definite symptoms referable to lack of vitamine A. Death usually occurred under 60 days. At autopsy the bones were somewhat fragile and the teeth brittle but not loose. Fractures appeared only after 50 days, and there were no hemorrhages comparable to those seen in scurvy. Microscopically the ribs show, at 21 days, slight changes comparable to those observed in partially protected and chronic scurvy cases. These changes are progressive, and by 30-40 days the rows of cartilage cells and trabeculi have almost disappeared, there is progressive atrophy of the marrow with ingrowth of connective tissue, and the cartilage often ends in a thin, ossified band.

D. Effect of Simultaneous Deprivation of Antiscorbutic and Vitamine A. These animals were fed on the basal diet of oats and bran and water alone. Only lack of growth and increasing thinness were observed up to 14 days. After that the joints became tender and the further course of the disease resembled scurvy, with death occurring a few days earlier, at about 25 days. Animals killed at 14 days showed nothing but poor general condition and slightly fragile bones. At death there were hemorrhages, fractures and brittle and loose teeth about as in scurvy. The microscopic findings in fractured ribs were similar to those in scurvy.

It is pointed out that the clinical picture is guinea pigs deprived of antiscorbutic alone is graver than that of pigs deprived only of vitamine A. In the first instance severe illness and death are inevitable, while in the second death as a direct result occurs only after a much longer period and is usually due to intercurrent disease. Loose teeth, tender and swollen joints and the "scurvy position" are signs of true scurvy, and hemorrhages, especially in the limbs, are a constant characteristic. Fractures may be regarded as symptomatic of scurvy, and occur much earlier than in cases of deficient feeding with vitamine A. Lack of both antiscorbutic and vitamine A does not seem to hasten the onset of scurvy symptoms, but death usually intervenes earlier than with scurvy alone. Severe scurvy symptoms obscure, both clincally and microscopically, those due to lack of vitamine A; mild or chronic scurvy can not be differentiated with certainty, histologically, from cases of deprivation of vitamine A, except that, as the author thinks, lack of vitamine A is followed by some atrophy of the marrow. It is noted that none of the guinea pigs studied showed, after deprivation of vitamine A, the general pathological picture of rickets as seen in children, characterized by softening of bones and disorderly growth of the epiphysis, with the development of osteoid tissue.

A short résumé is given of the work of some other investigators.—I. W. P.

2174 Notes on Vitamins. V. C. Vaughan. J. Lab. & Clin. M., St. Louis, 1921, **6**, 711-717.

An editorial which comments upon and gives a résumé of some comparatively recent investigations on the vitamines.—F. W. H.

2175 Experimental Rickets in Rats. I. A Diet Producing Rickets in White Rats and Its Prevention by the Addition of an Inorganic Salt. H. C. Sherman and A. M. Pappenheimer. J. Exper. M., Balt., 1921, **34**, 189-198.

The two following diets induced rickets in young rats: diet 83, Patent flour 95.0 per cent; calcium lactate 3.0 per cent; sodium chloride 2.0 per cent; diet 84, Patent flour 95.0 per cent; calcium lactate 2.9 per cent; sodium chloride 2.0 per cent, ferric citrate 0.1 per cent. The development of rickets was inhibited by substituting 0.4 per cent of secondary potassium phosphate for the same percentage of the calcium lactate in diet 84.—C. G. B.

2176. La questione delle vitamine e le avitaminosis. (*The Question of Vitamines and Avitaminosis.*)· *Le avitaminosi negli animali.* (*Avitaminosis in Animals.*) Alessandro Clerici. Clin. vet., Milano, 1921, **44**, 61-65.

The first article contains a general discussion of vitamines and abnormal conditions caused by lack of vitamines. The second article discusses briefly certain animal diseases caused by lack of vitamines.—F. W. T.

CANCER RESEARCH

(*See also Numbers, 2365, 2370*)

2177. Über Spalt- und Höhlenbildung. Primäre Hohlraumbildung oder Gewebsverflüssigung? (*Cleft and Cavity Formation. Primary Cavity Formation or Liquefaction of Tissue.*) B. Martin. Virchow's Arch. f. Path. Anat. (etc.), Berl., 1920, **228**, 384.

The author describes the formation of hygroma.—S. A. G.

DISEASES OF THE BLOOD, LYMPHATICS AND DUCTLESS GLANDS

(*See also Number 2340*)

2178. Typhus Fever Among Recent Immigrants. Experimental Demonstration of the Identity of this Disease with European Epidemic Typhus. **Peter K. Olitsky.** J. Exper. M., Balt., 1921, **34**, 365–374.

Blood taken from an immigrant arriving at the port of New York, and manifesting the symptoms of typhus fever, gave rise to experimental typhus in the guinea pig. By cross immunity experiments it was shown that this virus is identical with virus obtained from typhus fever patients during the epidemic of typhus fever in Poland.—C. G. B.

2179. On the Pathology and Pathogenesis of Spirochaetosis Icterohaemorrhagica. **Carlo Basile.** J. Path. & Bacteriol., Edinb., 1921, **24**, 277–285.

An experimental study is presented of the symptomatology and pathology of spirochaetosis icterohaemorrhagica in guinea pigs. The virus employed was exceedingly virulent, killing guinea pigs usually in 5–6 days after intraperitoneal inoculation. Organs for section were fixed in 10 per cent formaldehyde, alcohol, Schaudinn's fluid and Zenker's fluid, portions being stained also by Levaditi's and other methods for spirochetes.

Course of the disease in guinea pigs. Healthy pigs were inoculated intraperitoneally with heart's blood from infected pigs, diluted with 2 per cent sodium citrate; occasionally liver and lung emulsions were substituted for the blood. It is noted that jaundice may be absent, but that in both severe and mild cases hemorrhages in the internal organs are the most constant characteristic of the experimental disease.

Gross pathology. Jaundice, when present, shows in the skin of hairless regions and in the inner skin surface. Inguinal and axillary glands are hypertrophied. Hemorrhages of the skin, muscles and internal tissues may be very diffuse, but are sometimes local and almost petechial. Pulmonary hemorrhages are characteristic, being situated around the bronchi and in the vicinity of the pleura. Hemorrhages also occur in the serous surfaces, in the stomach and intestines, near the kidneys and in the epididymis and vas deferens. The liver is usually normal, but may show hemorrhages. The spleen is occasionally hypertrophied. The kidneys and adrenals are congested.

Microscopic pathology. Lung. Pulmonary hemorrhages, often very extensive are thought to be the most frequent cause of death in infected pigs. The most serious occur around the bronchi and may involve a large part of the pulmonary surface. In areas where the blood is being absorbed, the lung structure is seen to be intact. In places there is a suggestion of edema. Mitoses are found in the capillary epithelium and that of the bronchi and bronchioles shows proliferation. Spirochetes are rare in lung sections and there is no relation between the severity of the lung lesion and the number of spirochetes seen.

Liver. Lesions in this organ are inconstant, both in experimental and in human infections. In pigs dying acutely, in 5–6 days, there is a perivascular lymphoid reaction, the cells are sometimes vacuolated and multinuclear with small necrotic foci, sometimes the outline of the lobule is lost and bile stasis is observed. In more chronic cases (16 days) the cells are swollen and vacuolated, the nuclei deeply stained or karyolytic, necrotic foci extensive, involving the endolobular and perilobular connective tissue, and the bile capillaries distended. Spirochetes occur singly or in small groups and usually extracellularly.

Kidneys. Changes occur chiefly in the convoluted tubules, the ascending of loop Henle and the glomeruli, and consist of congestion or necrosis. The necrotic tubules are sometimes filled with cell debris and blood, accounting for the casts found in the urine. Mitosis in the tubules is not marked. The glomerular capillaries are congested and their cells degenerated, and in the lumen, as elsewhere, appear macrophages containing red corpuscles. The cells of Bowman's capsule are unchanged, though red corpuscles may be found in their midst. Perivascular infiltration may be seen, and occasionally there is hemosiderin in the tubules and glomeruli. Spirochetes are rarely seen, and when present appear chiefly in the lumen of the tubules.

Spleen. There is enlargement of the lymphatic nodules, congestion, phagocytosis of red cells and necrosis. Spirochetes are rare.

Adrenals. Diffuse congestion and a marked lymphocytic reaction.

Brain. Blood vessels deeply congested, as might be expected from the meningeal congestion observed grossly. Lymphocytic infiltration not marked. Spirochetes frequently found, especially in the meninges.

Testicle and epididymis. The epididymis is exceedingly hemorrhagic, appearing grossly as a red cap on the testicle. The tubular structure is unaltered, the intertubular capillaries are engorged and there is some blood in the intertubular spaces.

Pathogenesis of the Symptoms. Fever, hemorrhage and jaundice are the chief symptoms both in man and in animals. The hemorrhages are thought to be due to the action of toxic substances from the spirochetes upon the capillary endothelium, probably liberated when the organisms are phagocyted, since an exotoxin has not been demonstrated. Jaundice appears in experimental cases a few days before death, at a time when few organisms can be demonstrated in the blood. Most of the hemoglobin is changed into bilirubin, which the author believes can occur not only in the liver, but in the blood vessels and organs. It is noted that the jaundice may perhaps be due to inflammation and swelling of the duodenum and the papilla of Vater, producing a mechanical bile stasis. The general lymphoid reaction is thought to contribute to the destruction of the spirochetes and the defence of the organism, when coupled with the phagocytic action mentioned above. The accompanying anemia is accounted for by the marked phagocytosis of red blood cells observed.—I. W. P.

2180. *Untersuchungen über die Identität der Spirochaeta icterohaemorrhagiae (Inado und Ido) und der Spirochaeta icterogenes (Uhlenhuth und Fromme) und über das Verhalten der Spirochaeta hebdomadis, des Erregers des Siebentagefiebers ("Nanukayami"), gebenüber der Spirochaeta icterogenes. (Investigations on the Identity of Spirochaeta icterohaemorrhagiae (Inado and Ido) and the Spirochaeta icterogenes (Uhlenhuth and Fromme) and on the Relationship of the Spirochaeta hebdomadis, the Cause of Seven-Day Fever, ("Nanukayami"), to Spirochaeta icterogenes.* R. Kaneko and S. Morihana. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, Teil I, Orig., 1921, **31**, 201-221.

There remains some question as to whether hemorrhagic jaundice or Weil's disease is the same in Japan as in Europe. In Japan the disease is more fatal and enlargement of the spleen is rarely seen, in Europe the disease is less fatal and splenic tumor is often noted. To assist in the solution of this question, the authors compared cultures of the spirochete, isolated by Inado and Ido from cases of the disease in Japan with a strain from the European source, isolated by Uhlenhuth and Fromme. At the same time *Spirochaeta hebdomadis*, the supposed cause of a mild form of Weil's disease, known as seven-day fever was compared with the other spirochetes.

Morphologically and culturally, no significant differences were noted. The German strain of the spirochete was the most virulent for guinea pigs. An immune serum to the Japanese strain protected animals against infection with the German strain; and a serum against the German strain protected against the Japanese spirochete. Each serum, however, in respect to protection and spirochetolytic action was more active against its homologous organism that against the heterologous spirochete. From these facts, the authors conclude that both the Japanese and German spirochetes are of the same species.

The third organism, *Spirochaeta hebdomadis*, showed immunological differences from the other two.—S. B-J.

2181. *Rattenbisskrankheit in Deutschland. (Rat-Bite Fever in Germany.)* Friedrich Vorpahl. München. med. Wchnschr., 1921, **68**, 275-276.

The causative spirochetes in the case reported could not be demonstrated. The clinical picture however, and the prompt response to salvarsan treatment indicate that this was a true case of rat-bite fever.—B. C.

2182. *Lymphopenia Following Exposures of Rats to "Soft" X-Rays and the β-Rays of Radium.* J. C. Mottram and S. Russ. J. Exper. M., Balt., 1921, **34**, 271-273.

The authors have observed that even small doses of X-rays and the β-rays of radium cause a primary lymphopenia which lasts but a few hours. It is concluded that a temporary lymphopenia must have preceded the lymphocytosis caused by Murphy's "stimulating" dose of X-rays.—C. G. B.

2183. *Study of Transfused Blood. I The Periodicity in Eliminative Activity Shown by the Organism.* Winifred Ashby. J. Exper. M., Balt., 1921, **34**, 127-146.

Patients belonging to blood Groups I, II and III were transfused with about 500 cc. of Group IV blood. The rate of elimination of the transfused corpuscles was determined by diluting a specimen of the recipient's blood with Group IV serum, which agglutinated the native cells, and counting the unagglutinated cells. It was found that the rate of elimination varied in different patients, the transfused cells remaining in the recipient's blood from 30 to 100 or more days. The elimination was not gradual but periodic. The foreign corpuscles were rapidly eliminated during the active periods and then remained stationary for a time. In women the active periods coincided with the menstrual periods. It is concluded that the elimination of transfused blood probably takes place as a part of the periodic blood destroying and blood producing activity of the body.—C. G. B.

2184. *Studies on Transfused Blood. II. Blood Destruction in Pernicious Anemia.* Winifred Ashby. J. Exper. M., Balt., 1921, **34**, 147-166.

Thirty-three patients not of Group IV were transfused with Group IV blood. As a rule the foreign corpuscles were not eliminated more rapidly in cases of pernicious anemia than in patients who did not have any blood disease. It is concluded that pernicious anemia is not due to a hemolytic toxin.—C. G. B.

2185. *Hämatopoese (vorwiegent Erythropoese) der Niere bei kongenitaler Syphilis. (Blood Formation (Predominantly Erythrocytes) in the Kidney, in Congenital Syphilis.)* R. Bloch. Virchow's Arch. f. Path. Anat. (etc.), Berl., 1920, **228**, 285.

The author describes a case of congenital syphilis in a 6 weeks old child with true hemopoesis in the kidney.—S. A. G.

2186. *Untersuchungen über die Histologie der perniziösen Anämie.* (*The Histology of Pernicious Anemia.*) V. Ellerman. Virchow's Arch. f. Path. Anat. (etc.), Berl., 1920, **228**, 247.

The author describes the structural changes in the various organs of a number of cases of pernicious anemia in 2 of which he found a marked proliferation of large lymphoid cells in the liver and spleen as well as in the bone marrow. He gives a general discussion of the subject with excellent colored illustrations.—S. A. G.

2187. *Zur Frage der Änderung des histologischen Aufbaues der Thyroideae, Parathyroideae (Epithelkörperchen) und Glandulae Thyroideae accessoriae nach teilweisen oder gänzlichen Ausfall der Schilddrüsenfunktion.* (*The Histological Changes in the Thyroid, Parathyroid and the Accessory Thyroid Glands after Partial or Complete Loss of Thyroid Function.*) A. Trautmann. Virchow's Arch. f. Path. Anat. (etc.), Berl., 1920, **228**, 345.

The author concludes as follows: 1. After partial or complete loss of the thyroid function, the parathyroids of the goat retain their own structure.

2. In goats, thyroid extirpation produces an enlargement of the accessory thyroids that are present, a specific changing of the vesicular epithelium, an enlargement of the follicles, and a marked formation of colloid which is to be considered as a compensatory hypertrophic hypersecretion.—S. A. G.

DISEASES OF THE CIRCULATORY SYSTEM

2188. *Wolhynisches Fieber (Quintana' als Friedenserkrankung.* (*Quintan Fever during Peace Time.*) J. Neumann. Deutsche med. Wchnschr., Berl. & Leipz., 1921. **47**, 153–154.

A typical case is described in a patient who denied infestation with lice or exposure during military service.—B. C.

2189. *Ueber Kriegsendokarditis.* (*War Endocarditis.*) Erwin Becher. München. med. Wchnschr., 1921, **68**, 267–268.

A mild chronic endocarditis, caused by *Streptococcus viridans*, has been found relatively prevalent among former field transport men who had had no previous heart disease. A comparaively long period intervened between the field service and the onset of definite symptoms. The endocarditic changes were confined mainly to the aortic valves and progressed continuously to the mitral.—B. C.

2190. *Beiträge zur Pathologie der sypilitischen Myokarditiden.* (*Contributions to the Pathology of the Syphilitic Myocarditis.*) F. Takata. Virchow's Arch. f. Path. Anat. (etc.), Berl., 1920, **228**, 426.

The author states that syphilitic myocarditis occurs mostly in the left ventricle. In the constantly occurring necrotic areas he found production of tissue, namely, pieces of muscle fibres. At the periphery of the necrotic foci, besides round cells, there were also a large number of plasma cells. Giant cells in large numbers are also found.

At the periphery of the chronic gummous foci there is found a heavy layer of connective tissue. The vascular changes in this form of the disease are endarteritis, periarteritis, endophlebitis, as well as infiltration and thinning of the venous walls. The venous changes predominate. The gumma begin in the perivascular connective tissue.

The vascular changes, mentioned above, and circumscribed round cell infiltrations containing numerous plasma cells are specifically characteristic of the syphilitic fibrous myocarditis.—S. A. G.

DISEASES OF THE DIGESTIVE SYSTEM

(*See also Numbers 2239, 2332*)

2191. *Le pouvoir pathogène des bacilles de Morgan et de Castellani (Syndrome entero-hémorragique).* (*The Pathogenicity of the Bacilli of Morgan and of Castellani (Entero-hemorrhagic Syndrome).*) Dopter. Bull. Acad. de méd., Par., 1921, **85**, 301.

A fatal case of infection due to the Morgan bacillus has been recently described by Besson and de Laverne. The symptoms were choleraic in character, liquid stools containing practically no mucus succeeding each other without interruption. There was no blood. Tenesmus was absent. At autopsy the colon was normal. The mucosa of the small intestine was of an intense red color, with occasional hemorrhages. There was no proliferation of glandular tissue. These symptoms and lesions contrast strongly with those of the classical picture of dysentery, in which there are marked tenesmus, mucoid and hemorrhagic stools, and extensive ulceration and desquamation of the mucosa of the large intestine.

During the recent war the author saw many cases clinically similar to the above, especially among soldiers in the Argonne. The pathology was also identical. Two fatal cases were examined bacteriologically by Besredka, who isolated from the intestine of both cases a slightly motile rod, Gram-negative, not fermenting lactose (gas bubbles were formed, however), fermenting glucose, maltose, and saccharose with gas production, and forming indol. There was no agglutination with the anti-paratyphoid and the anti-dysentery serums. The intravenous injection of two-tenths of an agar slant killed a rabbit in 4 days, and with lesions similar to the human cases. The organism is apparently closely related to the Morgan bacillus, but is separated from it by the fact that it ferments saccharose and does not ferment lactose. It is classified as the bacillus of Castellani.

These two closely related organisms, the bacilli of Morgan and of Castellani, then seem to produce the same syndrome, entero-hemorrhagic in character, but entirely distinct from that produced by the true dysentery bacilli. It is entirely possible that other organisms belong to this group.—J. E. W.

2192. *Typhus mit allergischer Fieberkurve.* (*Typhoid with an Allergic Fever Curve.*) Franz Ickert. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 124–125.

A case is described in which the fever ran an undulating course as in those who have been prophylactically inoculated. The Widal reaction was not positive until the 46th day of the disease.—B. C.

2193. *Pseudoappendizitis, hervorgerufen durch Tuberkulose der Mesenterialdrüsen.* (*Pseudo-Appendititis Produced by Tuberculosis of the Mesenteric Glands.*) Fritz Hollenbach. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 125–126.

Two cases are described.—B. C.

2194. *Ueber akute Apppendizitis bei Tabes.* (*Acute Appendicitis in Syphilis.*) A. Krecke. München. med. Wchnschr., 1921, **68**, 298–299.

A destructive appendicitis is described which was peculiar in the complete absence of subjective or objective sensations of pain. Syphilis is claimed to have been the cause of this anesthesia.—B. C.

2195. *Zur Pathogenese und Klinik des Duodenalgeschwüres.* (*Pathogenesis and Clinic of Duodenal Ulcer.*) Gustav Singer. Wien. klin. Wchnschr., 1921, **34**, 43–44.

Neurogenic factors are shown to be of great importance in the pathogenesis of duodenal ulcer.—B. C.

2196. *Über die Darstellung und einige Eigenschaften des pathologischen Melanins II nebst Bemerkungen über das normale Leberpigment.* (*The Demonstration and Some Properties of Pathologic Melanin with Observations upon Normal Liver Pigment.*) E. Salkowski. Virchow's Arch. f. Path. Anat. (etc.), Berl., 1920, **228**, 468.

The definitive clearing of melanin may be accomplished by glacial acetic acid as well as by acidulated alcohol. Melanin contains organic phosphorus compounds produced by the nuclei of the cells. It does not stand in too distant relationship to albumin, and even contains the phenyl and tryptophan groups of the same.

Normal liver contains various pigments that are definitely differentiated from melanin.—S. A. G.

2197. *Erfahrungen über Anwendung von Terpentinölen und verwandten Mitteln bei entzündlichen und eitrigen Prozessen.* (*Results from the Use of Turpentine and Related Substances in Inflammatory and Purulent Processes.*) Moritz Mayer. München. med. Wchnschr., 1920, **67**, 572.

As an emergency measure, the administration of turpentine oils and related substances has been found valuable for internal application in purulent and inflammatory processes, such as appendicitis.—B. C.

DISEASES OF THE GENITO-URINARY SYSTEM

(*See also Numbers* ***2102, 2105, 2190, 2264, 2265, 2268, 2287, 2303, 2308, 2318, 2333, 2335, 2343, 2346, 2363, 2368***)

2198. *Note on the Preservation of Stock Strains of Treponema pallidum and on the Demonstration of Infection in Rabbits.* Wade H. Brown and Louise Pearce. J. Exper. M., Balt., 1921, **34**, 185–188.

It was found that *Treponema pallidum* constantly invades and localizes in the superficial lymph nodes of infected rabbits. The infection persists indefinitely and the organisms can be recovered by removing the glands (particularly the popliteals) emulsifying them and injecting normal rabbits. It is pointed out that this method can be used for preservation of stocks strains and the demonstration of infection in rabbits.—C. G. B.

2199. *Orchite suppurée due au Micrococcus melitensis.* (*A Case of Suppurative Orchitis Caused by the Micrococcus melitensis.*) P. Lombard and M. Béguet. Presse méd., Par., 1921, **29**, 753–754.

Following Malta fever, the patient developed abscesses in both testicles. From the pus of these abscesses, *M. melitensis* was obtained in pure culture.—L. A. K.

2200. *Zur Behandlung der Zystopyelitis.* (*The Treatment of Cystopyelitis.*) Otto Sachs. Wien. klin. Wchnschr., 1921, **34**, 85–86.

Intravenous injection of urotropin and of neosalvarsan is suggested.—B. C.

2201. *Spirochätotropie und Luesprophylaktika.* (*Spirochetotropism and Syphilis Prophylactics.*) I. Schereschewsky and W. Worms. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 176–177.

Four postulates must be satisfied by an effective prophylactic against syphilis. (1) It must cause an immediate killing of spirochetes when placed together with material containing many and actively motile spirochetes between a cover glass and slide. (2) In a human or animal syphiloma, it must produce a distinct effect within 24 hours after local administration. This effect is to be in the form of a great reduction or destruction of the spirochetes. (3) In experimental animal infections, the substance must be effective, at least, when applied 5 hours after infection. (4) It must be effective when tested on man.—B. C.

2202. *Grundsätzliches zur Frage der Abortivheilung der Syphilis.* (*Fundamentals of the Problem of the Abortive Cure of Syphilis.*) Karl Zieler. München. med. Wchnschr., 1921, **68**, 242–243.

Polemic against Meirowsky and Leven.—B. C.

2203. *Die Abgrenzung der I. von der II. Krankheitsperiode bei der Syphilis auf Grund experimenteller Trypanosomenstudien.* (*The Differentiation of the Primary from the Secondary Stage of Syphilis Based upon Experimental Studies with Trypanosomes.*) A. Stühmer. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 122–124.

I. Biological Differentiation. In the case of infection with *Trypanosoma brucei,* the following sequence of events is observed. The primary lesion advances for about 6 days with gland enlargement, and then subsides for 3 days when a new exacerbation of the disease appears (the secondary stage). During the primary stage, reinoculation is readily accomplished while during the secondary, reinoculation fails. Antibodies begin to appear on the 4th day and reach a maximum on the 11th. Immune reactions demonstrate that the original strain of trypanosome disappears by the beginning of the secondary stage and that a new strain, resistant to the antibody has appeared.

An analogous process is believed to take place in acquired human syphilis, which would indicate that there are immunologically different strains of *Spirocheta pallida* which should be differentiated.

II. The Differentiation Therapeutically. 152–153. During the primary stage, sterilization is readily accomplished in trypanosomiasis whether or not glandular swelling and blood infection have occurred. Even after the biological boundary between primary and secondary stage has been passed, i.e., after the appearance of the resistant strain in the blood, the sterilizing dose is not greatly increased. Only after general invasion of the body tissue does the necessary dosage jump to six times.

III. Relations to the Wassermann Reaction. 177–178. If further experiments should show that the biological conditions are alike in trypanosomiasis and syphilis then it would be erroneous, strictly speaking, to use the serum reaction as the deciding factor in separating the primary from the secondary stage. Practically, however, it would be desirable to set the boundary where the Wassermann reaction becomes positive for difficulties in treatment begin there. The clinical judgment of the individual case according to local findings, duration of the infection and general condition will always remain more important than the result of the Wassermann reaction. The latter is indeed a certain symptom of generalized syphilis; but it may sometimes fail, and on the other hand its presence conditions no unfavorable prognosis in the face of radical treatment.—B. C.

2204. *Über Endarteritis luetica congenita der Hirngefässe bei Kindern.* (*Congenital Syphilitic Endarteritis of the Renal Vessels in Children.*) A. Takahashi. Virchow's Arch. f. Path. Anat. (etc.), Berl., 1921, **232**, 95.

The author describes the pathogenesis of leutic arteritis obliterans.—S. A. G.

2205. *Beitrag zur pathologischen Histologie der gonorrhoischen Epididymitis.* (*A Contribution to the Pathological Histology of Gonococcic Epididymitis.*) J. Wolf. Virchow's Arch. f. Path. Anat. (etc.), Berl., 1920, **228**, 227.

The author found a destruction of the connective tissue tunic, a formation of granulation tissue which may produce an obliteration of the tubules similar to gonococcic salpingitis. He also describes vacuolation of the epithelium and proliferation of epithelial cells that infiltrate the granulation tissue.—S. A. G.

2206. *Experimentelle Vergleichsprüfung von Schutzmitteln gegen Geschlechtskrankheiten.* (*Comparative Experimental Tests of Prophylactics against Venereal Diseases.*) P. Manteufel and H. Zschucke. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 37–39.

The tests were made upon the gonococcus and *Spirocheta pallida in vitro.* In the animal experiments, the percutaneous infection of mice with the spirochete of recurrent fever was utilized. A 0.3 per cent sublimate-lanolin mixture was found to possess the double advantage of being bactericidal and mechanically protective.—B. C.

2207. *Neuere Probleme der Syphilisbehandlung.* (*Recent Problems in Syphilis Treatment.*) Fritz Lesser. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 39–41; 67–69.

The therapeutic problems are discussed in a general way.—B. C.

2208. *Bemerkungen zu Sterns "Parasyphilis."* (*Remarks upon Sterns "Parasyphilis."*) **Erich Hoffmann.** Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 234–235.

No evidence has thus far been offered that there exists a mild syphilis-like infection of different etiology, and that it is not a variation of syphilitic infection. A warning is voiced against regarding this milder infection as non-infectious and therefore requiring less rigorous treatment than syphilis.—B. C.

2209. *Zur Gewebslehre bei der Eingeweidesyphilis.* (*The Histology of Visceral Syphilis.*) **Walther Stoeckenius.** München. med. Wchnschr., 1921, **68**, 227–228.

The division of syphilis into primary, secondary and tertiary stages is a clinical convenience, but not of fundamental significance. In all three stages there develops the same process of inflammation; and there arise from the original hyperemia the most diverse grades of exudation, hyperlymphocytosis, reticulo-endothelial proliferation and connective tissue scars depending upon the strength of the unknown poison and the resistance of the organ involved.—B. C.

DISEASES OF THE LOCOMOTOR SYSTEM

2210. *Zytologische Untersuchungen tuberkulöser Gelenksergüsse.* (*Cytological Studies of Tuberculous Arthritic Secretions.*) **Walther Pewny.** Wien. klin. Wchnschr., 1921, **34**, 22–23.

Cytological examination of the exudates from tuberculous arthritides yields information of value in differential diagnosis. Typical cases are cited. In uncomplicated cases the leucocyte number is about 2000 to 3000, and when the bone is moderately involved the number rises to 20,000 to 30,000. Presence of a high percentage of erythrocytes differentiates usually, a chronic traumatic from a tuberculous arthritis.—B. C.

DISEASES OF THE NERVOUS SYSTEM

(*See also Numbers 2169, 2313, 2317, 2322, 2344*)

2211. *Negri Bodies in the Salivary Glands and Other Organs in Rabies.* **Lelia Jackson.** J. Infect. Dis., Chicago, 1921, **29**, 291–301.

The author's summary:

A careful study of the salivary glands of normal and rabid dogs makes it apparent that they offer favorable conditions for the growth of certain protozoa, some of the developmental forms of which render differentiation between them and certain forms of Negri bodies impossible or at least a very difficult task. It seems certain, however, that in many cases of rabies it is possible to identify Negri bodies in the salivary glands.—L. C. H.

2212. *Some Observations on Cistern Punctures.* **Henry McCusker.** J. Nerv. & Ment. Dis., New York, 1921, **53**, 453–456.

McCusker reports making 55 punctures of the cisterna magna in nine cases without difficulty and with less discomfort to the patient than that following lumbar puncture.—F. W. H.

2213. *Singultus-epidemien.* (*Hiccough Epidemics.*) **S. Loeb.** Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 238.

Three cases are reported. The etiology is unknown, but is probably related to influenza. It is peculiar that the incidence of the epidemic hiccough should be confined to men aged 20 to 55 years. Psychic influences are combined with somatic in the cases observed.—B. C.

2214. *Sobre tres casos de encefalitis letargica.* (*There Cases of Lethargic Encephalitis.*) **S. Dessy and F. L. Grapiolo.** Rev. Sud-Americana, Buenos Aires, 1920, **3**, 245–283.

This article includes an excellent historical treatment of the disease and an extensive bibliography. A diplò-streptococcus was obtained by blood culture from one case. This is similar to an organism frequently obtained from cases of influenza. Animal inoculations were negative.—G. H. R.

2215. *Ueber Mesencephalitis epidemica.* (*Encephalitis lethargica.*) **F. Umber.** Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 261–263.

A general report is given upon 36 clinical cases. The spinal fluid was normal in all except 4 cases which possessed a pressure of 300 mm. The blood also was sterile. A study of the blood nitrogen showed that there was present a toxically increased intermediary protein breakdown. This may have arisen from the medullary metabolic centers. The disease is not contagious. The etiology of epidemic encephalitis is in some way connected with influenza.—B. C.

2216. *Die Encephalitis epidemica.* (*Epidemic Encephalitis.*) **K. Bonhoeffer.** Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 229–231.

A clinical description is given of the various symptoms. The etiology of the disease is still undetermined. *Streptococcus pleomorphus* of Wiesner has been suggested as the causative agent. It is believed that encephalitis is a form of influenza localized in the brain.—B. C.

2217. Diagnostico bacteriologico de la meningitis cerebro espinal epidemica. (*Bacteriological Diagnosis of Epidemic Cerebrospinal Meningitis.*) M. M. Dominguez. San. y benefic. Bol. ofic., Havana, 1921, **25**, 172–199.

The method of obtaining specimens for diagnosis is described. There are a great variety of microscopic pictures found in different specimens of spinal fluid. A purulent spinal fluid is present in 35 per cent of the cases. The agglutination reaction is useful in abortive and chronic cases. A young culture of the meningococcus (18 to 24 hours) should be employed and several types of the organism should be tested. Agglutination seldom takes place in a serum at a dilution greater than 1 to 50. The precipitin test is also valuable. Reports on 33 cases of meningitis are included.—G. H. R.

2218. Ueber zwei Fälle von Meningismus bei Perforationsperitonitis. (*Two Cases of Meningism in Perforating Peritonitis.*) Franz Groebbels. München. med. Wchnschr., 1921, **68**, 176–177.

A mild serous meningitis developed in the two fatal cases described.—B. C.

2219. Die Syphilis des Zentralnervensystems, ihre Ursachen und Behandlung. (*Syphilis of the Central Nervous System, its Causes and Treatment.*) E. Finger. Wien. klin. Wchnschr., 1921, **34**, 33–34.

Remarks on Gemmerich's book of the same title.—B. C.

2220. Ueber das Verhalten des Liquor cerebrospinalis bei der artifizellen Remission der Paralyse. (*The Condition of the Cerebrospinal Fluid during the Artificial Remission of Neurosyphilis.*) O. H. Schmelcher. München. med. Wchnschr., 1921, **68**, 302–303.

Silver salvarsan was administered in the 5 cases of general paralysis reported. The Wassermann reaction in the blood and spinal fluid was modified more or less. Protein and globulin in the fluid was considerably reduced, but remained still within pathological limits. The gold sol reaction appears to be the most constant and reliable proof of neurosyphilis.—B. C.

2221. Zur Aetiologie der multiplen Sklerose. (*The Etiology of Disseminated Sclerosis.*) Fritz Kalberlah. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 102–103.

Two relatively early cases of disseminated sclerosis are described. Blood and spinal fluid from each were inoculated into rabbits. The blood vessels and livers of these animals contained numerous spirochetes.—B. C.

2222. Zur Kasuistik der Encephalomyelitis disseminata. (*A Case of Disseminated Encephalomyelitis.*) Erich Tiling. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 100–102.

The clinical description is given in detail.—B. C.

DISEASES OF THE RESPIRATORY SYSTEM (EXCEPT INFLUENZA AND TUBERCULOSIS)

(*See also Numbers 2262, 2280, 2319, 2337*)

2223. Studies on Pneumococcus Immunity. I. Active Immunization of Monkeys against Pneumococcus Type I Pneumonia with Pneumococcus Type I Vaccine. Russel L. Cecil and Gustav I. Steffen. J. Exper. M., Balt., 1921, **34**, 245–258.

Monkeys given 3 subcutaneous injections of pneumococcus Type I vaccine at weekly intervals were resistant to experimental pneumonia (pneumococcus Type I infections). The 3 doses of vaccine contained respectively 20, 40 and 60 billion organisms. Intravenous injections of smaller doses (from 300 to 1600 million organisms per dose) gave even a higher degree of immunity.

The sera of some of the monkeys conferred passive immunity upon mice, others failed to protect mice.—C. G. B.

2224. Studies on the Pneumonic Exudate. I. Effect of Preservation, Temperature, Dialysis, and Salt Concentration on the Enzyme in the Pneumonic Lung. Frederick T. Lord and Robert N. Nye. J. Exper. M., Balt., 1921, **34**, 199–200.

It was found that the enzyme remains active after preservation for 18 months. It is still active after heating to 65°C. for 1 hour but 75°C. for 1 hour inactivates it; the enzyme does not dialyze through celloidin sacs; activity persists when mixed with concentration of sodium chloride 32 times normal.—C. G. B.

2225. Studies on the Pneumonic Exudate. II. The Presence of Enzyme and Antienzyme in the Pneumonic Lung. Local Ferment-Antiferment Balance. Frederick T. Lord and Robert N. Nye. J. Exper. M., Balt., 1921, **34**, 201–205.

It was found that the proteolytic action of pneumonic lung is inhibited by fresh human serum when there are more than 3 parts of serum to 1 part of mashed lung. The inhibition is due to antiferment in the serum. It is indicated that proteolysis cannot aid resolution of the pneumonic lung until the serum antiferment is reduced to a non-inhibiting concentration, the cellular exudate predominating over the serum. Delayed resolution may be due to an excess of plasma.—C. G. B.

2226. Studies on the Pneumonic Exudate. III. The Presence in the Pneumonic Exudate of a Large Amount of Specific Antigen. Frederick T. Lord and Robert N. Nye. J. Exper. M. Balt., 1921, **34**, 207–209.

Specific precipitin reactions were obtained when pneumonic exudates were mixed with the homologous antipneumococcus serum. The test may be positive when the pneumonic fluid is diluted with 320 parts of normal saline solution.—C. G. B.

2227. Studies on the Pneumonic Exudate. IV. The Presence in the Pneumonic Lung of a Soluble Substance Inhibiting Agglutination by the Homologous Serum. Frederick T. Lord and Robert N. Nye. J. Exper. M., Balt., 1921, **34**, 211–216.

Pneumonic exudate does not agglutinate homologous pneumococci because the exudate contains inhibiting substances.—C. G. B.

2228. The Localization of Bacteria in the Upper Air Passages: Its Bearing on Infection. Arthur L. Bloomfield. Johns Hopkins Hosp. Bull., Balt., 1921, **32**, 290–296.

Bloomfield reports the results of serial differential cultures from the tongue, posterior pharyngeal wall, each tonsil and the anterior nares of 8 healthy persons who were exposed to various infectious diseases in the wards.

In the nose *Staph. albus* was always present, diphtheroids almost always and a variable transient flora of pathogenic and non-pathogenic bacteria.

From the tongue Gram-negative cocci and non-hemolytic streptococci were constantly isolated, diphtheroids in half the cases and occasionally a transient pathogenic or non-pathogenic organism.

The normal flora of the tonsil included Gram-negative cocci, non-hemolytic streptococci and diphtheroids. Various pathogenic and non-pathogenic bacteria were present as transients, while hemolytic streptococci were carried by two cases and *Staph. aureus* by one.

The pharynx showed a flora similar to the tonsils.

The general bearing of these studies on the question of the mechanism of respiratory infection is believed by the author to be:

"(1) Aside from the normal flora, bacteria do not, as a rule, grow free on the mucous surfaces of the upper air passages.

"(2) Special conditions are necessary to account for the presence of foreign organisms—either a local infection or a transient invasion."—F. W. H.

2229. Ventilation, Weather and the Common Cold. A Study of the Prevalence of Respiratory Affections among School Children and Their Association with School Ventilation and the Seasonal Changes in Weather. George T. Palmer. J. Lab. & Clin. M., St. Louis, 1921, **6**, 684–698.

Palmer in this portion of his article analyzes the sickness rates in individual rooms and schools and states that the following conclusions seem justified:

"1. Respiratory sickness is no greater in a window ventilated school room kept around 59 degrees than it is in a room where the temperature is 64.

"2. Respiratory sickness is greater in fan ventilated rooms, such as are represented in this study, than in window ventilated rooms, even though there is not more than a degree difference in temperature, and the fan rooms are more spacious.

"3. It is low temperature rather than chemical purity of the air which conveys the sensation of freshness."—F. W. H.

2230. Putride embolische Lungen Infektionen (Ätiologie und Pathologie). (The Etiology and Pathology of Putrid Embolic Lung Infections.) K. Bingold. Virchow's Arch. f. Path. Anat. (etc.), Berl., 1921, **232**, 22.

The author concludes that the principal exciting cause of embolic pulmonary gangrene is the anaerobic streptococcus. It plays an important rôle also in the ordinary gangrene of the lung through bronchial infection. An anaerobic streptococcic thrombo-phlebitic focus anywhere in the body produces lung complications even when the clinical symptoms for such are not pronounced. Other anaerobes and aerobes in putrid embolic lung processes may practically be disregarded. The anaerobic staphylococcus usually found in symbiosis with the anaerobic streptococcus may also enter the lung with the embolus and produce liquid pus.—S. A. G.

2231. Ueber nichttuberkulöse Lungensitzenkatarrhe. (Non-tuberculous Apical Pulmonary Catarrh.) G. Liebermeister. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 266–267.

Cases are cited in which apical lesions of the lung were non-tuberculous but due to apical bronchitis or broncho-pneumonia of influenzal origin. These respond readily to treatment. Perhaps some of the brilliant successes reported with Friedmann's tuberculosis vaccine were based on such cases as these.—B. C.

2232. Das Pneumothoraxverfahren bei der Behandlung der Pleuroperikarditis und Pleuritis sicca. (Pneumothorax in the Treatment of Pleuropericarditis and Adhesive Pleurisy.) Kurt Henius. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 7–8.

Two cases are cited. The procedure relieves pleuritic pain and prevents serious adhesions between pleura and pericardium.—B. C.

INFLUENZA

(*See also Numbers 2164, 2261*)

2233. *An Immunologic Study of Bacillus influenzae.* ALAN M. CHESNEY. J. Infect. Dis., Chicago, 1921, **29**, 132.

Twelve respiratory strains were studied from 11 patients. Four were found to be identical. No relationship to strains obtained from another source was evidenced. The author concludes that these results lend no support to the view that the influenza bacillus of Pfeiffer is the cause of epidemic influenza.—L. C. H.

2234. *Virulent Micrococcus catarrhalis in Influenza.* PAUL F. CLARK AND ELEANOR J. MURPHY. J. Infect. Dis., Chicago, 1921, **29**, 306–309.

During the epidemic of 1920 large numbers of Gram-negative cocci resembling *M. catarrhalis* were found. These when injected into rabbits in rather large amounts (1–2 slants) produced profound toxemia with a notable absence of pathological findings or of septicemia.—L. C. H.

2235. *Investigaciones bacteriólogicas en la epidemia de grippe.* (*Bacteriological Investigations, during the Epidemic of Grippe.*) C. SPADA, JR. Rev. Sud-Americana, Buenos Aires, 1920, **3**, 161–162.

The author finds that the predominating organism in the epidemic of 1919, as in that of 1918, is a diplo-streptococcus. This organism is obtained consistently from the sputum, blood cultures and from the organs at autopsy. It is pathogenic for rats but not for rabbits. It is suggested that this may be the same organism as has been obtained from cases of lethargic encephalitis.—G. H. R.

2236. *Beiträge zur pathologischen Anatomie der Grippe.* (*Contributions to the Pathological Anatomy of Grippe.*) D. JUHL. Virchow's Arch. f. Path. Anat. (etc.), Berl., 1921, **232**, 58.

The author gives statistics bearing upon the pathology and the bacterial flora of a number of cases of grippe.—S. A. G.

2237. *Die pathologische Anatomie der Influenza 1918–19.* (*The Pathological Anatomy of the Influenza of 1918–19.*) H. KOOPMAN. Virchow's Arch. f. Path. Anat. (etc.), Berl., 1920, **228**, 319.

The author believes that the port of entry of the primary influenza bacillus is the bronchus. The fatal cases were due to affection of the lungs and upper respiratory passages. On account of the special affinity of the influenza virus for the pulmonary vessels there is produced a hemorrhagic condition of the lungs and a tendency to necrotic tracheitis and bronchitis. The latter are due to secondary infection by various cocci which influence the course of the disease and lead to suppuration, to pneumonia dissecans, to empyema as well as to a heavy peri- and panarteriitis in the pulmonary vessels. They are also responsible for the occurrence of numerous organic complications.

Data of the findings of 113 cases in a second wave of the epidemic in 1920 are given. In 11 of these were found changes in the brain, ofttimes a perivascular hemorrhagic encephalitis, once an encephalitis with perivascular cell coverings, and 6 times a serous meningitis.—S. A.G.

2238. *Zur Kenntnis der Stenose der oberen Luftwege bei Grippe.* (*Stenosis of the Upper Air Passage in Influenza.*) ERNST STETTNER. München. med. Wchnschr., 1921, **68**, 233.

Stenosis in influenza may be as severe as in diphtheria, and may indicate incubation if the interference is not too far down the throat.—B. C.

2239. *Darmgrippe.* (*Intestinal Influenza.*) ALFRED ALEXANDER. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 152.

Intestinal influenza of an acute type is described from the clinical standpoint.—B. C.

2240. *Ueber kombinerte Stimmritzen- und Schlingkrämpfe nach Grippe.* (*Combined Dysphonia and Dysphagia following Influenza.*) HANS CURSCHMANN. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 149–150.

These symptoms are quite typical sequelae of influenza and appear to have a favorable prognosis. It is important to differentiate them from the laryngospasm of tetany and tabes and from whooping cough.—B. C.

2241. *Erfolgreiche Behandlung schwerer Grippepneumonien.* (*Successful Treatment of Severe Influenza-Pneumonias.*) ALBERT UFFENHEIMER. München. med. Wchnschr., 1920, **67**, 597–600.

The treatment is essentially symptomatic, strophanthin being injected intravenously in frequent doses, and should be begun before there is damage to the heart or to the vascular system.—B. C.

2242. Zur Behandlung der Grippe mit Sublimatinjektion. (*Treatment of Influenza with Sublimate Injection.*) Bennek. München. med. Wchnschr., 1920, **67**, 515.

The author injected graded doses of mercuric chloride, 1:1000, subcutaneously into 250 patients suffering from influenza, and found the treatment to affect the course of the disease favorably. Other symptomatic treatment was maintained at the same time.—B. C.

TUBERCULOSIS

(*See also Numbers 2193, 2210, 2263, 2278, 2320, 2321, 2323, 2324, 2325, 2326, 2327, 2328, 2334, 2341*)

2243. The Relationship between Bovine and Human Tuberculosis. R. M. Olin. J. Am. Vet. M. Ass., Wash., 1921, **59**, 741-745.

It is believed that bovine and human tuberculosis germs are separate and distinct individuals. The bovine organism may and does produce disease in the human. By eradicating tuberculosis in cattle, the lives of many thousands of children may be saved.—W. A. B.

2244. Die negative und positive Phase der Tuberkulinempfindlichkeit. (*The Negative and Positive Phase of Tuberculin Sensitiveness.*) F. Hamburger and K. Peyrer. Wien. klin. Wchnschr., 1921, **34**, 157.

The negative phase does not always make its appearance after an injection of tuberculin. Sometimes, the injection must be repeated or even increased in amount before this response is elicited. Antibody production, as well as opsonic index, varies according to these phases, if not identically, at least in a closely similar manner.—B. C.

2245. Die Aktivitätsdiagnose der Lungentuberkulose. (*The Diagnosis of Activity of Pulmonary Tuberculosis.*) E. Fraenkel. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 235-238.

Evidence shows that a great majority of persons possess tuberculous lesions of some sort, but this fact by no means implies that all these lesions require treatment or are dangerous. The significant question is whether tuberculosis is in the active stage. Pulmonary tuberculosis is active when the formation of fresh tubercles and progressive consolidation are demonstrable by physical means, or when a general toxic effect is observed. The activity of the disease is determined by the combination of usual clinical methods. There is so far no single test to determine this.—B. C.

2246. Ueber Oligurie nach Tuberkulininjektionen. (*Oliguria after Tuberculin Injections.*) Arnold Kirch. Wien. klin. Wchnschr., 1921, **34**, 61.

Three groups of cases presented oliguria following tuberculin injection. The first was marked by the presence of fever, which affects the water balance. The second comprised afebrile cases, and the oliguria is interpreted as a sign of a focal reaction in tuberculosis of the serosa. The third group included cardiac or cardio-vascular disease in older persons.—B. C.

2247. Hat die Tuberkulose in Deutschland wieder zugenommen? (*Has Tuberculosis again Increased in Germany?*) B. Möllers. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 2-4.

The tuberculosis death rate in Germany has gradually subsided since the middle of 1919. A reduction in morbidity from this disease is to be expected along with improvements in nutrition and living conditions.—B. C.

2248. Die tuberkulöse Durchseuchung der städtischen Bevölkerung und ihre Bedeutung für die Tuberkulosebekämpfung. (*The Extent of Tuberculosis in Urban Population and its Significance in the Tuberculosis Campaign.*) H. Selter. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 117-119.

Infection with tuberculosis begins in childhood, is unavoidable and acts apparently as a form of natural protective inoculation. This infection is, however, dangerous if acquired too early, so that young children should be kept away from coughing consumptives in the family. Infected children should be strengthened in constitution to counteract any predisposition to disease. At their age, they are readily cured by suitable treatment. In adults, proper nourishment is the best single line of treatment.—B. C.

2249. Die statistische Abnahme der Tuberkulose. (*The Statistical Decrease in Tuberculosis.*) A. Wolff-Eisner. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 214-215.

The conclusions of Möllers on the statistics of Königsberg for 1919 are challenged. The clinician has observed no marked reduction in morbidity from tuberculosis.

Möllers in reply insists that the statistics in the case presents the most reliable evidence upon which to base an opinion.—B. C.

2250. Sterblichkeit und Krankheit bei Tuberkulose. (*Mortality and Morbidity from Tuberculosis.*) H. Selter. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 4-6.

The statistics of Königsberg demonstrate the high tuberculosis mortality and morbidity during the war and the subsequent reduction. The relation between mortality and morbidity is shown in the following table.

Sickness and death from tuberculosis in Königsberg in 1919

AGE	SICK	DIED	LETHALITY
years	*number*	*number*	*per cent*
1	15	9	60.0
2–5	75	60	80.0
6–10	173	34	19.6
11–15	204	39	19.1
16–20	331	94	28.4
21–30	1078	191	17.2
31–40	1184	136	11.5
41–50	905	105	11.6
51–60	504	71	14.0
61–70	227	39	17.1
70+	95	19	20.0

—B. C.

2251. Ueber das Friedmannsche Tuberkulosemittel. (*The Friedmann Tuberculosis Cure.*) F. F. Friedmann. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 128–131.

Polemic against Kolle and Schlossberger, Uhlenhuth and Lange, and Schwalbe with replies from the latter.—B. C.

2252. Die chirurgische Behandlung der Lungentuberkulose. (*The Surgical Treatment of Pulmonary Tuberculosis.*) F. Sauerbruch. München. med. Wchnschr., 1921, **68**, 261–262.

It is possible to influence severe unilateral pulmonary tuberculosis in a favorable manner by surgical measures. Each case must be considered as a special entity, and it is desirable that the surgeon cooperate with an experienced clinician in the handling of the case.—B. C.

2253. Die Behandlung der sogenannten chirurgischen Tuberkulose durch den praktischen Arzt. (*Treatment of So-Called Surgical Tuberculosis by the Practicing Physician.*) August Bier. München. med. Wchnschr., 1921, **68**, 243–244.

A general discussion is presented for the practitioner.—B. C.

DISEASES OF CHILDREN

(*See also Number 2248*)

2254. Ueber die Indikation zur Intubation. (*The Indications for Intubation.*) Franz Hamburger. München. med. Wchnschr., 1921, **68**, 297.

Intubation to relieve laryngeal stenosis in diphtheria should be deferred as long as possible to the point where cyanosis is marked. This very conservative procedure has been of benefit to the patients.—B. C.

2255. Zur Masernprophylaxe. (*Measles Prophylaxis.*) M. Pfaundler. München. med. Wchnschr., 1921, **68**, 277.

It is practically impossible to prevent measles contacts among children, but the onset of the disease may be prevented by the use of convalescent's serum. The pooled serum from a number of cases is used. A "protective unit" consists of 3.5 to 4 cc. of this serum which is injected intramuscularly before the 5th day of incubation, or after contact. On the 5th and 6th day, double this quantity is required.—B. C.

2256. Zur pathologischen Histologie des Masernexanthems. (*The Pathological History of the Exanthem of Measles.*) S. Abramow. Virchow's Arch f. Path. Anat. (etc.), Berl., 1921, **232**, 1.

The author concludes that the virus of measles produces the same changes in the skin as in the mucous membranes but on account of the difference in the normal structure the appearance is different.

While in the mucous membrane there is produced a catarrh, the strong stratum corneum does not allow the desquamation of the degenerated cells so that they become separated in the direction of the corium where they are resorbed by phagocytes. All these processes together with the circulatory disturbances and infiltrations lead to the formation of an exanthem that is genetically quite analogous to the catarrh of the mucous membrane.

The perivascular infiltrations he considers as characteristic of measles while the infiltration around the hair follicles and skin glands he considers as accidental. Attempts at demonstration of the nature of the virus were unsuccessful.—S. A. G.

2257. Masern bei einem 4 Tage alten Brustkind. (*Measles in a 4-Day Old Infant.*) Erich Schulze. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 271–272.

The mother developed the illness *ante partum*. It is concluded that the infant became infected *in utero*.—B. C.

2258. Subcutaneous Injections of Oxygen in the Treatment of Pertussis. H. Chatiniere. L'Evolut. Medico-Chirur., 1920, **1**, 18; 46.

The author mentions the different methods of treating pertussis and discusses the merits of each. He has treated 14 cases with subcutaneous injections of oxygen and concludes that the injections of oxygen apparently influence the evolution of pertussis, modify the paroxysms in their intensity, form and number, and at the same time there is a general improvement of the patient. There are no contraindications to the use of oxygen. The technique is not as well perfected as yet as it should be. It seems best to begin with the small dose of one-fourth liter for a child 3 to 4 years old. A moderate dose of one-half liter has been used most frequently but sometimes a larger dose appears more effective. The interval between injections has been 3 days in most cases. The number of injections given a patient was from 3 to 10, but in most cases there was a marked improvement after 5 injections.—F. W. M.

2259. Zur Chinintherapie des Keuchhustens. (Quinine Therapy in Whooping Cough.) v. Starck. München. med. Wchnschr., 1920, **67**, 455–456.

Quinine preparations appear to act favorably in cases of whooping cough.—B. C.

2260. Herzmuskeltonus und postdiphtheritische Herzlähmung. (Cardiac Muscle Tonus and Post-Diphtheritic Cardiac Paralysis.) A. Eckstein. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 98–99.

It is true that the vagus and sympathetic innervation take part in post-diphtheritic cardiac paralysis, but the important damage lies in the heart muscle itself.—B. C.

2261. Influenzabazillus und chronische Lungenerkrankungen im Kindesalter. (Influenza Bacillus and Chronic Lung Diseases in Childhood.) Otto Bossert and Bruno Leichtentritt. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 150–151.

In these serious post-influenzal diseases, the regular occurrence of the influenza bacillus in conjunction with the development of bronchiectasis leads safely to the assertion of a causal relationship. Protracted and costly tuberculin cures, sanatorium treatment and anxiety regarding tuberculosis may be obviated by correct diagnosis based upon bacteriological findings and characteristic auscultation phenomena.—B. C.

2262. Die Erkrankungen der Respirationsorgane im frühen Kindesalter. (Diseases of the Respiratory Organs in Early Childhood.) Albert Nieman. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 182–184.

A group of respiratory diseases classed for convenience as "infantile influenza" is stated to occur both in and out of institutions. The individual cases are not clinically identical. No attempt was made to study them bacteriologically.—B. C.

2263. Le depistage de la tuberculose chez l'enfant au moyen de la réaction de fixation. (The Diagnosis of Tuberculosis in Children by the Complement Fixation Reaction.) J. Sévi. Presse méd., Par., 1921, **29**, 484.

Fifty-four presumably healthy children, aged 7 to 17 years, were tested by Besredka's technic. Four gave positive tests. On clinical examination, with the use of x-ray plates, early lesions of tuberculosis were found. The possible value of the reaction as a public health measure in diagnosis of early lesions of tuberculosis is emphasized.—L. A. K.

2264. Zur Therapie der Vulvovaginitis gonorrhoica infantum. (The Therapy of Gonorrheal Vulvo-vaginitis in Infants.) W. Patzschke. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 44–46.

Simultaneous control of hyperemia with adrenalin during application of a silver preparation has helped in controlling the disease.—B. C.

GYNECOLOGY AND OBSTETRICS

2265. Kasuistischer Beitrag zur Heilung der weiblichen Gonorrhoe durch interkurrentes Fieber. (Cure of a Case of Female Gonorrhea by Intercurrent Fever.) Hugo Döhler. Wien. klin. Wchnschr., 1921, **34**, 121.

A clinical cure of a chronic urethra-uterus gonorrhea was produced by a high intercurrent fever (38.5°–40°C.) of 4 weeks' duration.—B. C.

2266. Beitrag zur Behandlung gonorrhoischer Adnexerkrankungen und zur postoperativer Komplikationen nach gynäkologischen Operationen. (Treatment of Gonorrhea of the Genital Adnexa and of Post-operative Complications following Gynecological Operation.) Bucura. Wien. klin. Wchnschr., 1921, **34**, 195–196.

Persistent and thorough intra-uterine treatment including mixed vaccine therapy is considered, among others, as the best means of controlling the menace of spread of gonorrhea in surgical gynecology.—B. C.

2267. Zur Behandlung weiblichen Gonorrhoe mit intravenösen Kollargolinjektionen. (The Treatment of Female Gonorrhea with Intravenous Collargol Injections.) P. W. Siegel. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 269–270.

The intravenous injection of collargol, alone or combined with local treatment, in female gonorrhea must be abandoned as useless. It offers no improvement over local treatment, and is not without harm.—B. C.

2268. *Spirocheta-pallida-Befund in der Zervix bei primärer Lues.* (*Finding of Spirocheta pallida in the Cervix in Primary Syphilis.*) GEORG GELLHORN AND HUGO EHRENFEST. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 18.

A positive finding of spirochetes in the cervical secretion indicates the presence of syphilitic lesions in the uterus and perhaps even in the tubes.—B. C.

2269. *Die Toxizität der Plazentalipoide und ihre Rolle in der Aetiologie der Puerperaleklampsie.* (*The Toxicity of Placental Lipoids and their Rôle in the Etiology of Puerperal Eclampsia.*) H. SCHÖNFELD. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 270–271.

A convulsing poison is extractable from the lipoids of human placenta by alcohol, acetone and glycerine. It is thermolabile, and is inactivated by heating at 75° for 1 hour. The inactivated poison causes in animals pathological changes typical of eclampsia. In 'physiological' doses, the poison produces typical effects on the female genital apparatus.—B. C.

DERMATOLOGY

2270. *The Initial Exanthem of Smallpox.* M. TSURUMI AND S. ISONO. J. Infect. Dis., Chicago, 1921, **29**, 109–113.

According to the authors, smallpox patients who have been vaccinated once, show the initial exanthem on the outer surface of the upper arm. This fact, they claim, can be used as a point of differentiation between measles, scarlet fever and smallpox. Cases with the initial exanthem preceding the eruption usually give less severe symptoms. Of 39 cases showing this exanthem, 8 were moderately severe and 22 light.—L. C. H.

2271. *Variolaerkrankungen bei Neugeborenen.* (*Variola in the New Born.*) GUSTAV MORAWETZ. Wien. klin. Wchnschr., 1921, **34**, 129–130.

The new-born from variola-immune mothers frequently possess a lower susceptibility to smallpox, but this immunity should not be overestimated.—B. C.

2272. *Ueber Pemphigusbehandlung mit Terpentineinspritzungen.* (*Pemphigus Treatment with Turpentine Injections.*) GEWALT. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 104.

Intragluteal injections of turpentine were found to have a beneficial effect in the treatment of pemphigus.—B. C.

2273. *Pemphigusheilung durch Terpentineinspiritzungen.* (*Cure of Pemphigus by Turpentine Injections.*) BRENNING. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 187–188.

A case is described in which injection of turpentine oil was curative.—B. C.

2274. *Behandlung der Psoriasis vulgaris mit intravenösem Injektionen einer 20 per centigen sterilen Natrium salicylicum-lösung.* (*Treatment of Psoriasis Vulgaris with Intravenous Injections of a 20 per cent Sodium Salicylate Solution.*) OTTO SACHS. Wien. klin. Wchnschr., 1921, **34**, 185.

The keratolytic property of salicylic acid is utilized in combating psoriasis. In early cases, the efflorescences begin to disappear some weeks after the last injection of salicylate without the application of any local treatment.—B. C.

2275. *Ueber zwei Fälle von Erythema scarlatiniforme desquamativum recidivans (Besnier, Brocq).* (*Two Cases of Recurring Scarlatiniforme Erythema.*) HERBERT FUHS. Wien. klin. Wchnschr., 1921, **34**, 199–200.

This dermatosis is non-contagious, of acute onset and benign outcome. The desquamation is intense but angina is absent. Recurrences are very frequent.—B. C.

2276. *Zur spezifischen Behandlung der tiefen Trichophytie.* (*The Specific Treatment of Deep Trichophytosis.*) MAXIMILIAN STRASSBERG. Wien. klin. Wchnschr., 1921, **34**, 60–61.

Complete immunization in man against trichophytosis appears to be unattainable. As is well known, the deep ulcers may be cured by local treatment, but the use of various trichophytins accelerates recovery quite appreciably.—B. C.

2277. *Herpes zoster als einziges manifestes Symptom von im übrigen latent verlaufenden Erkrankungen innerer Organe.* (*Herpes Zoster as the Only Manifest Symptom of Otherwise Latent Diseases of Internal Organs.*) ALFRED ARNSTEIN. Wien. klin. Wchnschr., 1921, **34**, 13–14.

Herpes zoster appears in a certain number of cases as the only manifest symptom of disease of internal organs; and its appearance, therefore, should prompt a thorough internal examination. This may frequently reveal disease either in the vicinity of the zoster or in the neighboring organs. The author found it especially in liver and lung affections.—B. C.

OPHTHALMOLOGY

(*See also Number 2299*)

2278. *La conjunctivite purulente du nouveau-né n'est pas toujours gonococcique.* (*Purulent Conjunctivitis of the New-Born Is not Always Gonococcal.*) A. Cantonnet. Presse méd., Par., 1921, **29**, 426.

The purulent conjunctivitis often observed in new-born children is often not only free from gonococci but also of any demonstrable microorganisms. Scrapings from the mucous surfaces stained with acid Giemsa or by the Tribondeau stain show small "Prowazek" bodies in the epithelial cells. Similar forms have been demonstrated in the vagina of the mother or the urethra of the father. Clinically, conjunctivitis of this type is later in development, less ulcerative, and is not prevented by the instillation of silver nitrate at the time of delivery. Treatment is carried out by the use of silver nitrate, argyrol, and later weak solutions of zinc sulphate.—L. A. K.

2279. *Zur Kenntnis der Uebertragbarkeit der Keratitis herpetica des Menschen auf die Kaninchenkornea.* (*The Transmissibility of Human Herpetic Keratitis to the Rabbit Cornea.*) A. Luger and E. Lauda. Wien. klin. Wchnschr., 1921, **34**, 132.

The fact that human herpetic keratitis is transferable to rabbits is confirmed. Histologically, there is considerable nuclear change that appears characteristic for the disease.—B. C.

OTOLOGY AND NOSE AND THROAT DISEASES

2280. *Reactions of the Nasal Cavity and Postnasal Space to Chilling of the Body Surface. II. Concurrent Study of the Bacteriology of the Nose and Throat.* Alfred Goldman, Stuart Mudd and Samuel B. Grant. J. Infect. Dis., Chicago, 1921, **29**, 151–160.

Previous papers by the authors have shown that chilling of the body surface causes reflex vasoconstriction and diminished blood supply to the oral, nasal and nasopharyngeal mucous membranes. The purpose of this paper is to present the studies of changes in the bacterial flora of these parts due to or concurrent with the vasoconstriction. Four subjects were used. 5 per cent rabbit blood agar was the medium employed and cultures were taken of the various portions of the mucosa with separate swabs. Hemolytic streptococci appeared in 3 persons studied, in 2 preceding symptoms of colds and sore throat. In one subject *M. catarrhalis* appeared preceding symptoms of infection at two different times.—L. C. H.

ORAL BACTERIOLOGY

2281. *Stomatitis ulcerosa.* (*Ulcerative Stomatitis.*) Wilhelm Wallisch. Wien. klin. Wchnschr., 1921, **34**, 197–198.

The disease is described clinically as running through 4 principal stages. (1) The initial lesion on the gums; (2) the spread outward, accompanied by foul breath; (3) appearance of suppurations on the tongue and cheek; and (4) invasion into underlying tissues. The genuine disease is differentiated from other ulcerations.—B. C.

2282. *Zwei Fälle von Noma-ähnlichen Erkrankungen der Haut.* (*Two Cases of Noma-like Diseases of the Skin.*) Plaut. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 211–212.

In parts of Europe cases of ulcerative stomatitis have been occurring in epidemic proportions in conjunction with Plaut-Vincent's angina. This stomatitis, ordinarily mild, has been running a severe and sometimes fatal course. The causative organism is without doubt the fuso-spirillary bacillus. Two such severe cases are cited.—B. C.

FILTERABLE VIRUSES

2283. *Notes on the Histo-pathology of Typhus Fever.* A. C. Stevenson and Andrew Balfour. J. Path. & Bacteriol., Edinb., 1921, **24**, 289–304.

A fairly detailed historical sketch of previous work is given, with special reference to the work of Herzog.

The material upon which the present study is based consisted of tissues taken at autopsy from 5 fatal cases of typhus fever occurring in the Caucasus. From all were available cerebrum, cerebellum, aorta, lung, spleen, liver, pancreas, kidney and adrenal; from 4 there were also trachea and cardiac muscle; from 3 small and large intestine; from 2, lymphatic glands; from 1, stomach, duodenum and skin. Four of the cases were uncomplicated, the fifth being complicated clinically with pneumonia, though examination of lung sections indicated that the lung condition in this case was only a more advanced form of what was found microscopically in all the other cases.

Summary of microscopic findings in all cases;

Cerebrum. In rapidly fatal cases (8–12 days) there was a condition suggestive of thrombosis of the vessels, in places presenting the appearance of the so-called typhus nodule, described by Fraenkel and others. Mononuclear infiltration of the extra-muscular coats of the vessel walls was also observed, varying from a few scattered leucocytes to a continuous single layer partly or completely surrounding the vessel. Pigment occurred in the vessel walls in most cases, and was also seen in nerve cells. A few ganglion cells showed vacuolation and some nuclear degeneration, and in two cases there were small areas of softening showing leucocytic infiltration.

Cerebellum. Slight changes in 3 cases. Some infiltration of the vessel walls of the pia mater.

Aorta. No typical changes, except perhaps an apparent loosening of the tissue layer between the intima and the media, observed in 3 cases. In 2 cases there was some calcification of the media and in 2 there was atheroma.

Heart. In all cases there was excess of yellow pigment around the muscle nuclei. In 3 cases there was leucocytic infiltration among the fibers and around the vessels, a few megalokaryocytes being seen in one case.

Lung. A varying degree of broncho-pneumonia present in all cases. In places there was fibrinous or purulent exudate into the alveoli, a few megalokaryocytes being found among the pus cells. Organisms observed were (a) Gram-positive organisms resembling pneumococci and (b) much smaller Gram-negative diplococci in clumps. In one case some of the vessels showed masses of cells attached to their inner walls suggestive of the "typhus nodule," with some degeneration of the vascular walls, mostly in the sub-endothelial and muscular layers.

Trachea. Congestion in all 4 cases examined. Sub-mucous hemorrhages and some sub-mucous round cell infiltration in one.

Spleen. The vascular changes here were better marked than in any other organ except the brain and lung. They consisted chiefly of a sub-endothelial infiltration of highly granular cells staining readily with acid dyes, similar cells being found in the lumen of vessels, practically occluding them. There was swelling and degeneration of the muscular coats. The degree of engorgement of the organ varied greatly and the cells of the pulp showed marked phagocytosis of blood elements. There was considerable pigment in the cells, but in one case it was malaria.

Liver. The most constant changes were leucocytic infiltration of the portal canals and phagocytosis of red blood corpuscles and other cells by the swollen endothelial cells. In one case there were degenerated areas filled with hemorrhage, and in another suppuration along the portal canals, many leucocytes containing acicular crystals. Slight fatty degeneration, mainly sub-capsular. No marked vascular changes.

Pancreas. Some cellular degeneration in all cases, possibly partly post mortem.

Adrenals. Normal.

Kidneys. Only one case showed marked changes, consisting of hemorrhages and casts in the tubules and some areas of small cell infiltration between the tubules. In this case and one other there was also a considerable amount of brownish pigment in the cells of the straight tubules.

Lymphatic glands. The spaces of the areolar network seemed larger than usual and there was a marked deficiency of lymphocytes. Some leucocytic infiltration of the vessel wall, one vessel showing a mass of acidophilic cells with drawn-out nuclei between the endothelium and the other coats. In one case there was a vessel containing a mass resembling blood platelets.

Intestinal tract. All these tissues showed post mortem changes. More or less engorgement of the vessels was present, with some hemorrhages into the mucosa, true also of the stomach, in which there was a small superficial ulcer. One case showed an ulcer of the large intestine, many of the endothelial cells in the lymph spaces surrounding it containing crystals like those from the liver of the same case.

Skin. Some perivascular leucocytic infiltration and a few small hemorrhages.

In the main the findings of the authors agree pretty closely with those of other writers, notably Herzog. They believe that the single perivascular layer of cells observed by them in parts of the brain should be stressed. They were unable to demonstrate marked myocardial degeneration, but think this may have been due to the fact that the papillary muscles, in which these changes are said to be most marked, were not available. The cell proliferations described in the pancreas were not seen, and the lymph glands, instead of showing the cell increase described by Herzog, showed fewer cells than usual. The mitoses described by Herzog in the masses of cell infiltration were not encountered, nor was there seen any primary necrosis in the endothelium of the pre-capillaries.

Granules were observed in many organs, but the only ones which the authors believe can be considered as possible Rickettsia are those seen in the nerve cells of the cerebrum, the vessels of the brain and lung, the cells and vessels of the splenic pulp and the Kupfer cells of the liver. These bodies are small diplococcal forms measuring 1 micron in length, each half of the diplococcus being spherical and under 0.5 micron in diameter. They stain both with basic and acid dyes. Other and larger bodies, some of them resembling clumps of blood platelets, were observed in the liver and spleen, but it is noted that the true nature of all these bodies and granules has still to be determined.—I. W. P.

SURGICAL BACTERIOLOGY

(See also Number 2089)

2284. *Zur Wundbakterienflora.* (*Bacterial Flora of Wounds.*) W. J. Klug. Deutsche med. Wchnschr., Berl. & Leipz., 1921, 47, 14–15.

A case is described in which an operative wound (appendectomy) contained fusiform bacteria and spirochetes causing a disease indistinguishable, except bacteriologically, from pharyngeal diphtheria.—B. C.

2285. *Zur Differnenzierung der Erreger der Gasödemerkrankung.* (*Differentiation of Organisms in Gas Edema Infection.*) K. Joseph. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 240–241.

Zeissler's human blood-glucose-agar plates were utilized in an attempt to differentiate the various forms of anaerobes occurring in gas infections. The method may be useful as a preliminary step, but differentiation on the basis of colony formation is not to be preferred to study of toxin formation, neutralization with antitoxin and protection with antiserums.—B. C.

2286. *Ein Fall von Spätgasphlegmone.* (*A Case of Retarded Gas Phlegmon.*) E. Schellenberg. München. med. Wchnschr., 1921, **68**, 270.

The patient was operated on soon after being wounded by a shell fragment, and there was no sign of gas infection. Four further operations were performed, and only after the last, when the shot was removed, 15 months after the wounding, did the dreaded complication set in. It would seem that the organism became encapsulated along with the shot and was released during the operation.—B. C.

2287. *Zwei Fälle von Spontangangrän des Hodensackes.* (*Two Cases of Spontaneous Gangrene of the Scrotum.* Leopold Schönbauer. Wien. klin. Wchnschr., 1921, **34**, 96–97.

Anaerobic bacilli of the edema group were found responsible for the infection in one of these cases.—B. C.

2288. *Ueber den Bacillus dermophilus: ein Beitrag zur Wunddiphtheriefrage.* (*Bacillus dermophilus: A Contribution to the Wound Diphtheria Problem.*) Carl Rhode. München. med. Wchnschr., 1921, **68**, 234.

Neisser's diphtheroids, the pseudo-diphtheria and the xerosis bacilli are gouped under the single head: *Bacillus dermophilus* to avoid associating them with diphtheria. Three sub-groups are recognized: a long type, a short type and a xerosis type.

In 117 wound smears there were found 6 of genuine diphtheria and 18 of *B. dermophilus;* and in 132 examinations of closed suppurations, the latter was found only 3 times.—B. C.

2289. *Ueber Wundbehandlung mit nicht entfettetem Mull* (*Rohmull, Rohgaze*). (*Wound Treatment with Undegreased Muslin, Raw Muslin, Raw Gauze.*) K. Propping. München. med. Wchnschr., 1921, **68**, 299–300.

Raw gauze is much less adherent than the hydrophilous variety. Raw gauze gives a good drainage of wounds and at the same time keeps them moist, thereby aiding regeneration. It also acts as a hemostatic agent.—B. C.

SEROLOGY

(*See also Numbers 2085, 2263, 2361, 2363, 2367, 2371*)

2290. *Studies on Heterophile Antigen and Antibody.* T. Taniguchi. J. Path. & Bacteriol., Edinb., 1921, **24**, 241–256.

Since, among lipoids, lecithins are considered the most important constituents, and since it has been shown that the ether-soluble, acetone-insoluble tissue extract, or so-called "lecithin," is the one which mainly acts as antigen in the Wassermann reaction, the lecithin fraction of heterophile tissue was examined to determine whether it was the main constituent responsible for the specific reaction between heterophile antibody and alcoholic extracts of corresponding antigens. The lecithin fraction was prepared according to the method of Browning, Cruickshank and McKenzie (1910, 1912). Lecithins from horse heart and kidney were prepared as representing the constituents of heterophile antigens, and those from ox heart and human heart as representing non-heterophile antigens. The results showed that there was no marked difference with the various lecithins, either in their hemolytic action with cobra venom or when used as antigens in the Wassermann reaction, but in the specific reactions with heterophile antibody the lecithins from heterophile antigens showed the same specific properties as the crude extracts. The addition of cholesterol to the lecithin was found to enhance the power of the lipoid emulsion for eliciting the specific reaction, as with alcoholic tissue extracts, while turbid emulsions, produced by slow mixture of lecithin and saline, were more efficacious than clear emulsions due to rapid mixture. After boiling for four hours (78°C.), the alcoholic solutions of lecithins from heterophile tissues were found to have kept unchanged their specific property, evaporation having been prevented during boiling by means of a reflux condenser.

It is pointed out that while the specificity of lipoids from different animals has been established, this specificity is quite distinct from that of proteins in the usual immunity reactions, the distribution of the specific receptors in tissues acting as heterophile antigens having no relationship to species specificity or to the group reaction of related species. The specific receptor for the heterophile antibody is lipoid and not protein, and it is thought that the phenomenon gives strong support to Erhlich's conception of specificity as depending on chemical structure (constitution specificity).

It is noted that normal human serum contains a varying amount of hemolytic immune body for sheep corpuscles, shown to have the character of heterophile antibody, while heterophile antigen is widely distributed both in the higher animals and in micro-organisms. Attention is drawn to the possibility of errors in diagnosis arising from these conditions, unless due care is taken notably in the Wassermann reaction. It is pointed out that reactions between the lipoids of heterophile antigen and heterophile antibody are probably the cause of anaphylactic shock in animals whose tissues contain heterophile antigen, when heterophile antibody is administered parenterally; this would explain the primary toxicity of certain antisera for particular animal species.

An effort was made to determine whether the lipoids of heterophile tissues (alcoholic extract of guinea pig kidney and the "lecithin" fraction of horse heart) were capable of generating immune body on injection into animals. Rabbits of 1500–2000 grams were used, each receiving intraperitoneally 4 or 5 injections of lipoid emulsion at weekly intervals. The results showed a slight increase in anti-sheep hemolysin in the sera of some animals injected with lipoids of heterophile tissues, while parallel experiments with lipoids of non-heterophile tissues did not influence the anti-sheep hemolysin. The slight increase noted was found to be greater than the variations in anti-sheep hemolysin commonly observed in normal rabbits, which indeed are thought to possess in their serum a fairly constant quantity of this natural antibody. It is noted that the slight antigenic effect here observed may be due to traces of protein persisting in the crude alcoholic extracts and the lecithin fractions. The receptors of heterophile tissues were found to pass practically quantitatively into the alcohol when thorough extraction had been carried out, the residue, from which most of the specific receptors had been removed, being markedly deficient in antigenic power. The antigenic power of heterophile tissue (guinea pig kidney) was found not to have deteriorated greatly after boiling for one hour in salt solution. It is believed that the proteins of heterophile tissue, when deprived, through extraction with alcohol, of their specific lipoid, no longer possess the power to generate heterophile antibody, the slight degree of antigenic power of the residue being due, probably, to the fact that the specific receptors have not been entirely dissociated from the protein. It seems probable that the specific lipoids of heterophile tissues can act as antigens only when present in combination with protein. Apparently there is no other well-established instance of a substance possessing the specific property of binding antibody but lacking the power of generating it. Once the combination has been dissociated, mixtures of the components do not exert the action of the native compounds.—I. W. P.

2291. *Ueber die antikomplementäre Wirkung der Einhuferseren. Beitrage zum Mechanismus der antikomplementären Serumwirkungen. (On the Anticomplementary Action of the Serum of the Ungulates. Communication on the Mechanism of the Anticomplementary Action of Serum.)* R. Manninger. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, Teil I, Orig., 1921, 31, 222–248.

The anticomplementary action of the serum of the horse, mule and donkey is a function of its globulin content. The degree of the anticomplementary action is not dependent upon the absolute amount of globulin present, but upon the ratio between albumin and globulin in the serum, the so-called "protein quotient."

The "protein quotient" is expressed as $\frac{\text{albumin}}{\text{globulin}}$. If the quotient is small, the anticomplementary action is great, and a higher inactivation temperature is necessary to overcome it. The anticomplementary action of horse serum can generally be annulled by heating at 55°C. for 20–30 minutes; of mule and donkey serum by heating at 63°–65°C.

The globulin of the serum of these animals acts in an anticomplementary manner because the degree of its dispersion provides an optimal surface for adsorption phenomena. The globulin adsorbs the portion of complement known as the "end-piece."

Under the influence of heating, a reaction takes place between the globulin and water, converting the globulin from a partial suspensoid into an emulsoid. As a result of this change it loses its ability to adsorb complement.

Coagulated globulin is not anticomplementary, since its surface is not suitable for adsorption of complement.—S. B-J.

2292. *Ueber Isoagglutinins beim Neugeborenen. (Isoagglutinins in the New-Born.)* R. Hess. Deutsche med. Wchnschr., Berl. & Leipz., 1921, 47, 241–242.

Several hundred tests were made of the isoagglutinins of newborn and their mothers, as well as the reactions between mother and child, between mothers and between children.

Of 678 maternal sera, 26 per cent agglutinated.

Of 484 maternal erythrocytes, 24.9 per cent were agglutinated.

Of 330 infant sera, 3.3 per cent agglutinated.

Of 149 infant erythrocytes, 3.3 per cent were agglutinated by adult serum of appropriate type.

These facts confirm Happ's findings that the newborn arrive with a deficiency of agglutinins.—B. C.

2293. *A Note on the Claim that Agglutinins Are Lipoidal in Nature.* Charles Krumwiede and W. Carey Noble. J. Immunol., Balt., 1921, 6, 201–205.

The writers could find no evidence to support Stuber's claim that the agglutinins in an immune serum are lipoidal in character. Immune anti-typhoid serum (horse) was extracted with ether but the treatment did not remove the agglutinins.—R. R. H.

2294. Die Steigerung des Agglutinintiters durch Aderlässe. (The Effect of Withdrawal of Blood upon the Agglutinin Titer.) O. Olsen. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, Teil I, Orig., 1921, **31**, 284–289.

The author was unable to confirm Langer's experiments on the raising of agglutinin titers in immunized animals by withdrawing blood from them daily. Rabbits with agglutinin titers of 1–1280 or 1–10,000 were bled daily, 20 cc. of blood being removed at each venesection. The results were somewhat variable, but in general, the agglutinin titer of the serum diminished under this treatment.—S. B–J.

2295. Nochmals: Die Steigerung der Antikörper (Agglutinine) durch Aderlässe. (On the Increase of Antibodies (Agglutinin) following Bleeding.) H. Langer. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, Teil I, Orig., 1921, **31**, 290–292.

Langer presents additional protocols showing the results of titrations of agglutinin in the serum of immunized rabbits after repeated daily bleedings. In some of these animals, the agglutinin titer rose from 1–50,000 to 1–200,000 after 5 daily bleedings.—S. B–J.

2296. The Relation between the Absorption of Antibodies and the Isolated Protein Bodies. Rokuro Umemura. J. Immunol., Balt., 1921, **6**, 205–222.

Antityphoid horse serum was fractionated with ammonium sulphate into euglobulin and pseudoglobulin. Each protein body was diluted with distilled water until it showed the same agglutinating titre as that of the undiluted serum of a horse immunized against the typhoid bacillus 1:20,480. Rabbits that gave a natural titre of less than 1:40 for typhoid bacilli were selected and were injected with (1) the whole serum; (2) the pseudoglobulin; (3) the euglobulin. Four sets of rabbits were used with 3 rabbits in each set. One set was injected with (1),(2) and (3) subcutaneously, one intramuscularly, one intravenously and one intraperitoneally. It was found by titrations made at varying intervals that the rate of absorption of antibody depends upon the quantity of proteins associated with it. There is no difference in the rate of absorption of the antibodies of each isolated protein.—R. R. H.

2297. The Precipitin Reaction Used as Evidence for the Identification of Human Blood in an American Court. John B. Ekeley. J. Lab. & Clin. M., St. Louis, 1921, **6**, 709–710.

This is the report of a case in which the results of the application of the precipitin test were used as evidence for the identification of human blood. The author is under the impression that this is the only recorded case of the use of the results of this test as evidence in an American court.—F. W. H.

2298. Studies in Complement Fixation. I. The Rate of Fixation of Complement at Different Temperatures. R. L. Kahn. J. Exper. M., Balt., 1921, **34**, 217–230.

Rabbits were immunized with purified proteins (edestin and phaseolin) and their sera used in specific complement fixation tests which were planned to determine the influence of temperature on the rate of fixation. It was found that fixation was complete within about 4 hours and that the reaction occurred with practically the same rapidity at ice box temperature (8° to 12°C.), room temperature (18° to 20°C.), and 37°C.—C. G. B.

2299. The Antibodies for Sheep Blood and the Complement of the Aqueous Humor in Normal and Immunized Rabbits. Ryuzo Kodama. J. Infect. Dis., Chicago, 1921, **29**, 161–170.

The study was undertaken to determine the presence of antibody and complement in the aqueous humor in the hope of throwing light on the permeability of blood vessels for various immune bodies. It was found that the serum of normal rabbits contains lysin, opsonin and agglutinin for sheep corpuscles but no precipitin. The aqueous humor contains small amounts of lysin and opsonin but no agglutinin or complement and no precipitin for sheep serum. On immunization against sheep cells the antibodies accumulate in the blood but the aqueous humor shows an increase in lysin and opsonin only, remaining free from the other antibodies. On removal of aqueous humor by puncture, the new fluid formed has a greater amount of antibodies than the original fluid. Normal conditions are regained in about 24 hours.—L. C. H.

2300. Specificity of Anti-Organ Sera. Moyer S. Fleisher and Natalie Arnstein. J. Immunol., Balt., 1921, **6**, 223–234.

Rabbits were injected with liver, kidney, spleen, muscle and testicle from the guinea pig. The immune serum obtained was used in complement fixation and absorption tests to determine tissue specificity. It was found that the degree of specificity varies in the different tissues. In some cases the specificity is absolute, in others it is only relative. The writers claim that the structure of tissues is multigenerous, apparently able to stimulate the production of 3 types of immune bodies; first, the immune bodies common to the species, the subtances showing species specificity; second, the immune bodies, which are specific for the tissue, showing tissue specificity; and third, the immune bodies which have a definite relationship with tissues other than the one under consideration.—R. R. H.

2301. Thyroidectomy and Parathyroidectomy with Relation to Development of Immune Substances. Enrique E. Ecker and Harry Goldblatt. J. Exper. M., Balt., 1921, **34**, 275–294.

It was found that thyroidectomized rabbits produced more potent anti-sheep hemolysins than normal rabbits. This was also true of rabbits which had undergone thyroidectomy and parathyroidectomy. If the parathyroidectomy is complete, hemolysin production is greatly reduced. Thyroidectomy and partial parathyroidectomy caused no serious disturbances in the animals but complete parathyroidectomy caused severe tetany and many of the animals died.—C. G. B.

2302. *Ein Beitrag zur Frage des Wesens der Wassermannschen Reaction. (A Communication on the Question of the Mechanism of the Wassermann Reaction.)* F. M. Meyer. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, Teil I, Orig., 1921, **31**, 278–283.

Rabbits injected with the aqueous extract of the liver of a syphilitic fetus develop antibodies to this mixture. When the immune serum from such an animal and the watery extract of a syphilitic liver are used in the Wassermann reaction, complement is fixed. This experiment, however, is inadequate to answer the question whether a similar specific component has any rôle in the practical Wassermann reaction, in which the alcoholic extract of a normal organ is used as the antigen. The serum of a rabbit immunized to syphilitic liver fixes complement also in the presence of alcoholic extracts of normal organs. The alcoholic extract of a normal organ, on the other hand, does not act as a true antigen, as it is incapable on injection of stimulating an animal to produce antibodies which fix complement in tests with the aqueous extract of syphilitic liver. The author concludes that the mechanism of the Wassermann reaction in syphilis is not yet known.—S. B-J.

2303. *The Ice-Box Modification of the Wassermann Test in the Diagnosis and Treatment of Syphilis.* Albert Keidel and J. E. Moore. Johns Hopkins Hosp. Bull., Balt., 1921, **32**, 296–298.

Keidel and Moore discuss the ice box test from the view-point of its practical application in the diagnosis and, more especially, as a guide in the treatment of syphilis.

Parallel tests were done on 300 cases (normal, syphilitic and suffering from clinical non-syphilitic diseases) with both plain and cholesterinized antigen, at 37°C. and at ice-box temperature.

In the authors' opinion the ice-box method is decidedly superior in the selection of treated but uncured syphilitics. They also guardedly favor its use for diagnosis, but accept positive results only after careful scrutiny of all available data in the case.—F. W. H.

2304. *Observations on the Wassermann Test Using a Method of Prolonged Fixation at Ice-chest Temperature.* E. J. Wyler. J. Path. & Bacteriol., Edinb., 1921, **24**, 349–354.

A summary is here given of the results in over 700 parallel tests of sera carried out with the technique devised by Griffith and Scott (1920) embodying icebox fixation, and the routine method used at the Military Hospital, Rochester Row (1918). The antigen used in the cold fixation method here described differed somewhat in its preparation from that advocated later by Griffith and Scott, giving occasional non-specific fixation sufficient to produce a slight degree of inhibition of lysis. Donald's drop technique was used throughout, the tests being performed in groups of 11–44 serum samples. The average period of icebox fixation was 19 hours.

In all, 719 sera were tested, including 132 which were tested more than once. Briefly, the results were as follows:

535 (74.4 per cent) gave the same result by both methods.
167 (23.2 per cent) showed less fixation by the routine method.
16 (2.2 per cent) showed less fixation by the cold fixation method.

A more detailed consideration of the results follows:

1. Results with 224 sera of well-treated cases: Here the cold fixation method seemed to yield a much higher proportion of positive results than the routine method. However, non-specific fixation did occur, though usually weak in character. In no case was there more lysis by cold fixation than by the routine method.
2. Results with sera of 100 untreated cases of syphilis. In this series cold fixation was not appreciably more sensitive than the routine method, and in some cases was less so.
3. Results with 238 sera sent "for diagnosis." These included, in addition to "new" cases, patients who had at some time undergone antisyphilitic treatment and were sent to the hospital for test. In this series it appeared that the method of cold fixation did not present any marked superiority over the routine method.

The delicacy of the cold fixation method is brought out when high dilutions of serum are used, fixation being complete in some cases with a dilution of 1:160.

The chief value of the cold fixation method seems to be as a test of cure in well treated cases, though it is noted that a slight degree of non-specific fixation may occur, as well as occasional undue fixation of complement in Row B of the complement titration (complement and antigen).—I. W. P.

2305. *The Hecht-Gradwohl Test Employing Ice Chest Fixation. A Preliminary Report.* H. D. McIntyre, E. A. Worth and A. P. McIntyre. J. Lab. & Clin. M., St. Louis, 1921, **6**, 706–708.

The authors compare the results obtained with 100 sera, 50 from syphilitics and 50 from non-syphilitics, when tested by the Wassermann and the Hecht-Gradwohl techniques with both plain and cholesterolized antigens and with fixation at 2° and at 37.5°C.

They find the Hecht-Gradwohl test with fixation at 2°C. has all the advantages pointed out by Gradwohl together with those of the ice chest method of fixation, while it also obviates the error arising from the fact that the complement in human serum frequently deteriorates at 37.5°C. in a half hour.

The authors state that theoretically the Hecht-Gradwohl test with ice-box fixation should be the technique of choice but that practically, in a large series of cases, the ice-box Wassermann and the ice-box Hecht-Gradwohl tests would agree in nearly all instances.—F. W. H.

2306. Ueber eine kombinierte Sach-Georgi-Wassermannsche Reaktion. (*A Combined Sach-Georgi-Wassermann Reaction.*) Egon Keining. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 157–158.

A cholesterinized extract is used as antigen for both the Sachs-Georgi and the Wassermann tests. Other details as to the tests are not given fully. It is believed that different serum constituents are responsible for these two tests: the Sachs-Georgi being a lipoid precipitation, and the Wassermann (complement fixation) due to activity of the euglobulins.—B. C.

2307. Ueber eine kombinierte Sachs-Georgi-Wassermannsche Reaktion. (*A Combined Sachs-Georgi-Wassermann Reaction.*) V. Kafka. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 269.

A technic similar to that of Keining was employed. After the Sachs-Georgi reaction was completed, complement and sensitized sheep's blood, or first complement and amboceptor followed one hour later by sheep's blood was used for the Wassermann.—B. C.

2308. Wassermansche und Sachs-Georgische Reaktion bei Syphilis, III. (*Wassermann and Sachs-Georgi Reaction in Syphilis, III.*) Tr. Baumgärtel. München. med. Wchnschr., 1921, **68**, 235–238.

The original reactions of Wassermann, Kaup, Sachs-Georgi and a modified Wassermann were compared upon 500 consecutive sera. Modifications of the Wassermann test consisted in doubling the amount of serum, or halving the amount of complement, or both. In treated syphilis, the Wassermann reaction failed, the Kaup remained positive, and the Sachs-Georgi was retarded in appearance. In untreated syphilis the agreement among the three tests was close.—B. C.

2309. Erfarungen mit der Sachs-Georgischen Reaktion. (*Experience with the Sachs-Georgi Reaction.*) Eberhard Leonhardt. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 267–269.

The Sachs-Georgi reaction is a valuable adjunct to the Wassermann reaction in the diagnosis of treated, latent and metasyphilitic cases. However, the significance of the Sachs-Georgi reaction in primary syphilis is not so definite. The fact that there are still a considerable number of failures militates against the exclusive use of this test. The difficulty in preparing the extract prevents, for the present, the application of this test outside of specialized laboratories.—B. C.

2310. Ueber den Einfluss des Alkohols auf die Flockung von Lipoidantigenen. (*The Influence of Alcohol on the Flocculation of Lipoid Antigens.*) Rudolf Müller. Wien. klin. Wchnschr., 1921, **34**, 196–197.

Alcoholic extract of beef heart when mixed with water produces an opalescent solution, and the addition of more water leaves this solution lighter but unchanged. On the other hand, addition of alcohol to the mixture results in a flaky precipitation of the colloid. Still more alcohol redissolves the precipitate. Concentrated salt solutions may be used to replace the water in the above phenomenon. In certain zones, salt solution also precipitates colloidal lipoid. A colloidal lipoid solution produced by the mixture of alcohol-soluble lipoid and NaCl solution may be precipitated not only by increase of the salt concentration, but also by corresponding additions of alcohol. The phenomenon is assumed to be due to alteration of the surface tension of the dispersion medium.—B. C.

SERUM THERAPY

(*See also Numbers 2089, 2255*)

2311. Antibody Studies. I. Reversal of the Antigen-Antibody Reaction. F. M. Huntoon. *II. The Recovery of the Antibody from Sensitized Antigens. Technic.* F. M. Huntoon and S. Etris. *III. Chemical Nature of Antibody,.* F. M. Huntoon, P. Masucci and E. Hannum. J. Immunol., Balt., 1921, **6**, 117–200.

I. The first part of these studies is a general introduction in which the author cites previous attempts by different investigators to effect a reversal of the antigen-antibody reaction. The writer concludes that complete reversal of the antigen-antibody reaction may be impossible, but there is abundant proof of a partial reversal enabling the production of antibody solutions in a more or less pure state. Only a certain proportion of the attached antibody can be removed, the remaining is in all cases, somewhat more than the minimal sensitizing dose. The writer thinks that a graduated variability in the firmness of the union exists and that those antibodies which are less firmly bound are the first to be dissociated. This view is in contradiction to the idea that the antibodies are attached to the antigen in two distinct portions in sharply different degrees of firmness.

II. The authors give in detail a large series of experiments on the separation of agglutinins from sensitized bacteria; the protective antibody from sensitized pneumococcus antigen and the bactericidal antibodies from sensitized bacteria with the aid of various solutions under different conditions. The conclusion is reached that the phenomenon of dissociation of the antibody-antigen combination is apparently governed by the dilution of the binding salt present and that the nature of this binding salt differs for different antibodies.

This theory will explain many of the facts noted in such dissociation work.

For example:

"1. The comparative failure of the dissociation of agglutinin and hemolytic amboceptor in salt solution and their dissociation in solutions not containing this salt.

"2. The dissociation of protective antibody and bactericidal antibody in salt solution.

"3. The influence of heat in hastening the reaction.

"4. The influence of time when dissociation fluids are kept at low temperatures.

"5. The failure to show any influence of the surrounding tonic conditions on such dissociation."

III. Negative results are given with the idea that they are of value in narrowing the possible field of investigation. The conclusion is that antibodies do not belong to that group of proteins usually considered under the head of serum proteins.

"1. The antibody molecules are of large size, not being dialysable, indicating the colloidal nature of the substance.

"2. Antibodies are not affected by trypsin over considerable periods indicating either that they are not protein in nature, or have been racemized by the dilute alkali used, or belong to the peptide group having a carboxylamino linkage.

"3. Antibodies are not precipitated by solutions having little or no electrolytic content, indicating that they are not of euglobulin nature.

"4. Antibodies are not soluble in ether, therefore are not of the lipin group.

"5. Antibodies free from gross amount of globulins are not precipitated or affected by a short exposure to 30 per cent sodium chloride solution, indicating that they are not of a pseudoglobulin nature.

"6. Antibodies are not injured by certain dilute alkalis or acids.

"7. Antibodies are not affected by temperature up to 60°C. Higher temperatures progressively destroy or alter their nature.—R. R. H.

2312. Polyvalent Antibody Response to Multiple Antigens. F. M. Huntoon and S. H. Craig. J. Immunol., Balt., 1921, **6**, 235–247.

Experiments by the wrers and?! a consideration of the results obtained by other workers lead to the conclusion that there is nothing in the immunity mechanism itself to preclude the possibility of a very wide polyvalent antibody production. That many animals under multiple antigen immunization fail at times to respond with as great a volume of production as occurs with single antigens may be explained by other factors such as depreciation of the general physical condition due to the large amounts of bacterial protein injected.—R. R. H.

2313. Zur Serumbehandlung der Meningokokken-Meningitis. (*Serum Treatment of Meningococcus Meningitis.*) Kern. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 73.

A case is described in detail. The serum treatment is believed to have been beneficial.—B. C.

HYPERSENSITIVENESS—ANAPHYLAXIS, ALLERGY

(*See also Numbers 2134, 2362*)

2314. Anaphylaxis Reactions with Purified Proteins from Milk. H. Gideon Wells and Thomas B. Osborne. J. Infect. Dis., Chicago, 1921, **29**, 200–216.

A review of the literature is given followed by the authors' experiments. There is chemical evidence of 4 chemically distinguishable proteins of milk: (1) casein, (2) lactalbumin, (3) lactoglobulin, and (4) an alcohol soluble protein. Anaphylactic tests indicate that these proteins are biologically distinct, furnishing another illustration of the fact that immunologic specificity is dependent on chemical composition rather than biologic origin. Of these four proteins, only one, the globulin, sensitizes to beef serum. It seems that immunologic methods may be a great aid and in many cases indispensable in preparing proteins in a state of purity and in furnishing information concerning the chemical relations of proteins from different sources.—L. C. H.

2315. Origine anapylactique de certaines crises d'hydrorrhée nasale. Traitement antianaphylactique. (*The Anaphylactic Origin of Certain Types of Acute Nasal Hydrorrhea. Antianaphylactic Treatment.*) P. Vallery-Radot, J. Haguenau and A. Watelet. Presse méd., Par., 1921, **29**, 764–765.

A description of a case of sensitization to ingested albumin, apparently induced by therapeutic injections of diphtheria antitoxin in 1911. The symptoms gradually increased until a nocturnal attack of asthma, recurring at a definite hour, continued into a matutinal sneezing attack with a copious watery discharge from the nose. Blood counts after a meal showed a short lasting leucopenia. The ingestion of peptone in 1 gram doses one hour before the evening meal for a few weeks gave relief from all symptoms for a period of 4 or 5 months after the admininstration of peptone was discontinued.—L. A. K.

2316. Die Filtrationsfähigkeit des Anaphylatoxins durch keimdichte Filter (Berkfeldkerzen und Membranfilter de Haen). Ueber Anaphylaxie. LXII Mitteilung. (The Filterability of Anaphylatoxin through Filters which Retain Bacteria, Berkefeld Candles and the Membranous Filter of Haen. Studies on Anaphylaxis, LXII.) E. Friedberger and P. Konitzer. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, Teil I, Orig., 1921, **31**, 293–300.

The ability of anaphylatoxin to pass through Berkefeld filters and the filter membranes of Haen, which retain bacteria, was tested in a number of experiments. Each filter was found to have individual peculiarities. When first used, the filters adsorbed a large amount of the bacterial anaphylatoxin. As filtration continued, more of the poison passed through the candles or membranes. In all cases, the toxicity of the anaphylatoxin, which was prepared by allowing guinea pig serum to act upon bacteria, was reduced per unit volume by filtration. It was, however, never completely removed by these filters which were impervious to bacteria. This result indicates that anaphylatoxin is not of a corpuscular nature, at least does not occur as particles large enough to be retained by these filters.—S. B–J.

VACCINE PROPHYLAXIS AND THERAPY

(*See also Numbers 2095, 2130, 2132, 2136, 2138, 2142, 2143, 2251*)

2317. Antirabic Vaccination by Means of Desiccated Virus. Rigney D'Aunoy. J. Infect. Dis., Chicago, 1921, **29**, 261–267.

The technic of the preparation of desiccated virus by the Harris method with the author's modifications is described. The advantages claimed for this method are: (1) its keeping qualities, very little diminution in infectivity occurring over periods of a year or more at low temperatures; (2) ease and accuracy of standarization; (3) safety as evidenced by apparent reduction in untoward effects, such as paralysis, in the patient.—L. C. H.

2318. Que peut-on attendre actuellement de la vaccinothérapie dans le traitement des colibacilluries? (What is the Present Status of Vaccine Therapy in Colon Bacillurias?). A. Mauté. Presse méd., Par., 1921, **29**, 443–445.

The author employs autogenous vaccines prepared by emulsifying the moist (colon) organisms in 10 per cent NaOH, and after 12–24 hours at incubator temperature, neutralizing with HCl to the point of the first faint precipitate. With vaccines prepared in this way, chronic pyelonephritis and cystitis have been remarkably benefited and even cured.—L. A. K.

2319. Traitement des affections pulmonaires par le vaccinothérapie. (The Treatment of Pulmonary Affections by Vaccinotherapy.) J. Minot. Presse méd., Par., 1921, **29**, 553–554.

The predominant organism is determined by counting 10 fields of a sputum spread on 3 successive days. A vaccine is prepared by mixing representative stock types of the majority forms in the proportions in which the organisms were observed in the cultures, to a total of 500 millions per cc. Asthma, emphysema and catarrhal bronchitis were markedly benefited by such treatment. In pneumonias, a stock vaccine was employed with similar success. Chronic nephritis is a contraindication to vaccine treatment.—L. A. K.

2320. Immunisierungs- und Heilwirkungen säurefester Stäbchen (Möller, Friedmann) gegen die Tuberkulose von Versuchstieren. (Immunizing and Curative Effects of the Möller, Friedmann Acid-fast Bacilli upon Experimental Animal Tuberculosis.) Martin Kirchner. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 174–176.

Neither Möller's "lizard tubercle bacillus" nor Friedmann's "turtle tubercle bacillus" is able to immunize guinea pigs or rabbits aginst human or bovine tubercle bacilli. Neither is it possible to cure tuberculous sheep, guinea pigs or rabbits by treatment with one of the above acid-fast bacilli.—B. C.

2321. Die prozentual abgestufte Ponndorf-Impfung. (The Fractionally Graded Ponndorf Vaccination.) Hans Koopmann. München. med. Wchnschr., 1921, **68**, 205.

Safety is increased and dosage is rendered practicable in the graded administration of Old Tuberculin according to the Ponndorf method. The procedure is particularly useful for ambulant cases.—B. C.

2322. Die Ponndorfsche Kutanbehandlung. (The Ponndorf Cutaneous Treatment.) Kroschinski. München. med. Wchnschr., 1921, **68**, 205–206.

The Ponndorf technic is to make several skin scratches deep enough just to draw blood, and then to rub into them 3 to 5 large drops of Old Tuberculin. This is repeated according to the case after 8 to 10 days for weeks or months. Kroschinski reports the favorable results he obtained in a variety of nervous diseases by this mode of treatment. How the non-specific effect is produced remains a matter for speculation.—B. C.

2323. Bemerkungen über das spezifische Tuberkulosemittel Tebecin Dostal. (*Remarks on Dostal's Specific Tuberculosis Vaccine: Tebecin.*) P. **Buro.** Wien. klin. Wchnschr., 1921, **34,** 228–229.

Dostal's vaccine is derived from bacilli non-pathogenic for animals. It is described as being effective in the treatment of tuberculosis.—B. C.

2324. Ueber die Masttuberkelbazilleneinheitsvakzine Tubar. (*Tubar, the Enriched Tubercle Bacillus Unit Vaccine.*) A. **Strubell.** München. med. Wchnschr., 1921, **68,** 239–240.

Tubercle bacilli were enriched by the author's process and then broken up to yield a fluid having fever-producing properties. This is the basis of the vaccine "Tubar" which contains all the partial antigens of the tubercle bacillus plus an enrichment of the lipoid antigens. It is intended for use in the primary and secondary stages of human tuberculosis.—B. C.

2325. Die Behandlung der Tuberkulose mit lebender, avirulenter Vakzine in Steigender Dosis. (*The Treatment of Tuberculosis with Living Avirulent Vaccine in Increasing Doses.*) **Felix Klopstock.** Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47,** 211.

The fiasco resulting from Friedmann's 'cures' should not discourage further experimentation along the same lines. Dosage of the vaccine should not follow a hard and fast rule but should be guided by the focal reaction, the general condition and the lung findings. Persons with frank cases of tuberculosis are suitable patients. Phthisiophobes or suspects are unsuitable. Prophylactic injections in infants are likewise of doubtful wisdom. The author's use of a turtle strain of tubercle bacillus, probably identical with Friedmann's strain, yielded favorable results.—B. C.

2326. Fettantikörper. (*Fat Antibodies.*) **Hans Much.** Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47,** 209–211.

The protein-free neutral fat from the tubercle bacillus calls forth a stronger reaction in man in a dilution 100 times weaker than the tubercle protein itself. This is evidence for the existence of fat antigens. An animal may be sensitized to the fat while the reaction to the protein remains unaltered, and vice versa. Fat and protein here refer to the Much partial antigens.—B. C.

2327. Immunbiologische und klinische Untersuchungen mit den Partialantigenen, Deycke-Much. (*Immunological and Clinical Studies of the Deycke-Much Partial Antigens.*) W. **Unverricht.** Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47,** 8–9.

Clinical and immunological tests do not confirm Much's claim of a sharp differentiation between the soluble and insoluble portions of hydrolyzed bacteria. There is present in humans a hypersensitiveness toward both these fractions. The reactivity toward them showed no constant differences.—B. C.

2328. Hat das Friedmannsche Tuberkuloseheilmittel schädliche Wirkungen? (*Has the Friedmann Tuberculosis Remedy Harmful Effects?*) H. **Grass.** Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47,** 243–244.

Three cases are cited which show that the Friedmann vaccine may indirectly transform a mild tuberculosis into a very severe form.—B. C.

NONSPECIFIC THERAPY

2329. La proteinterapia con caseinate de sodio. Algunas observationes clinicas. (*Some Clinical Observations on Protein Therapy with Sodium Caseinate.*) V. **Fossati and** P. V. **Mammana.** Rev. Sud-Americana, Buenos Aires, 1921, **4,** 115–126.

The authors find that the injection of non-specific protein such as sodium caseinate has not the same effect in all diseases. In pneumonia the number of white blood cells may be considerably increased, whereas in typhoid fever a considerable leucopenia may result. Non-specific therapy is more convenient, has given no ill results and seems to shorten the course of the disease. Accepted remedies should also be used.—G. H. R.

2330. Heilentzündung und Heilfieber mit besonderer Berücksichtigung der parenteralen Proteinkörpertherapie. (*Inflammation-and Fever-Therapy with Special Regard to Parenteral Protein Therapy.*) **August Bier.** München. med. Wchnschr., 1921, **68,** 163–168.

The development of modern parenteral protein therapy is traced from early experiments in homologous and heterologous blood transfusions. It is held that Weichardt's theory of protoplasmic activation is but a paraphrasing of the old Virchow theory of cell stimulation.—B. C.

2331. Ueber Leistungssteigerung und Herdreaktion. (*Functional Acceleration and Focal Reaction.*) L. **Veilchenblau.** München. med. Wchnschr., 1921, **68,** 238–239.

The effect of serum, e.g. diphtheria antitoxin, is a combined one, consisting of two components, specific and non-specific. To obtain an optimal non-specific effect the matter of dosage is important. A specific focal reaction results in lysis of the disease process-cure. The non-specific focal reaction varies according to the relative strength of the defense or the attack.—B. C.

2332. Ist eine organische Vaguserkrankung die Ursache des Ulcus ventriculi chronicum beim Menschen? (Is Organic Vagus Disease the Cause of Chronic Gastric Ulcer in Man?) Gottfried Holler. Wien. klin. Wchnschr., 1921, **34**, 223–225.

Intravenous protein therapy in the form of "vaccineurin" has been found to give improvement in gastric ulcer and other diseases referable to vagal malfunction. This result is held to give a positive answer to the above question.—B. C.

EXPERIMENTAL INFECTION

2333. Superinfection in Syphilis and Its Relation to Subtreatment. Paul G. Woolley. J. Lab. & Clin. M., St. Louis, 1921, **6**, 717–719.

An editorial comment on Brown and Pearce's article reporting the successful reinfection of luetic animals that had received inadequate treatment.—F. W. H.

2334. Experimenteller Beitrag zu den Beziehungen zwischen Phlyktänen und Tuberkulose, nebst Bemerkungen über abazilläre Tuberkulose. (Experiments on the Relations between Phlyctena and Tuberculosis, with Remarks on Abacillary Tuberculosis.) Guillery. München. med. Wchnschr., 1921, **68**, 201–202.

Experimental phlyctena of the uvea were produced by intravenous injection of the tubercle poison. The resulting structures had a distinct tuberculoidal arrangement. The experimental animals were absolutely free of tubercle bacilli. Staphylococcus toxin produces the same picture. The uveal phlyctena are considered as abacillary tuberculosis produced by the toxin in a particularly favorable spot.—B. C.

2335. Experimental Syphilis in the Rabbit. VII. Affections of the Eye. Wade H. Brown and Louise Pearce. J. Exper. M., Balt., 1921, **34**, 167–183.

The authors' summary and conclusions:

"From the study of a number of instances of eye infection in the rabbit, it was found that a variety of affections might occur following scrotal or testical inoculations of *Treponema pallidum*. Those observed included ciliary injection, conjunctivitis, keratitis, and iritis which might occur separately or in combination with one another, except that keratitis and iritis were always accompanied by a reaction in the ciliary vessels and usually by a conjunctivitis.

"Several forms of each of these affections were described, and while some of them were regarded as presenting a very characteristic picture, it was recognized that the conditions present in other cases were not sufficiently distinctive to permit of a clinical diagnosis. With a few exceptions, however, the pathology of the lesions was sufficient to identify them as processes of a syphilitic nature.

"It was found that this group of lesions usually arose from a common focus of infection which was located in the episcleral tissues immediately surrounding the cornea. From this point, the infection tended to spread to the conjunctiva and the cornea, or toward the canal of Schlemm and the spaces of Fontana and thence to the ciliary body, the iris, and choroid. The localization of the lesion and the mode of extension were held to be responsible for the combination of manifestations usually observed.

"From analysis of the circumstances under which affections of the eyes occurred, it was found that the great majority of them occupied a definite position in the scheme of tissue reactions, being the only generalized lesions developed or the last type of lesion to appear.

"These facts together with the unusual frequency of relapse in these affections, were believed to indicate that a low degree of protection was conferred upon these tissues by reactions taking place elsewhere and that the protection afforded by the local reaction was of a feeble character. This deduction was in part confirmed by the fact that it was found to be possible to increase or decrease the incidence of eye lesions by the use of experimental means which varied the scheme of reaction in animals inoculated with a given strain of *Treponema pallidum*."—C. G. B.

2336. The Lesions Produced in Rabbits by the Inoculation of Streptococci Isolated from Rheumatic and other Lesions in the Human Subject. W. W. C. Topley and H. B. Weir. J. Path. & Bacteriol., Edinb., 1921, **24**, 333–346.

Six strains of streptococcus were used in these experiments, all obtained from human cases; 4 were from cases of endocarditis, 1 from a case of meningitis complicating a boil, and 1 from a case of phlegmonous gastritis and peritonitis. Of the cardiac cases, 2 had shown rheumatic symptoms, and the strain from one of them was isolated during life from the blood stream. The other 5 strains were isolated post mortem. The following results were obtained on rabbit inoculation:

Rabbits

STRAIN	SOURCE*	NUMBER	UNAFFECTED	DIED OR KILLED MORIBUND		KILLED		NOTES
				Number	Lesions	Number	Lesions	
5189	En., Rh.	29	3	8	Ar. 23; P. 17; En. 2; Ap. 1	—		Virulence not increased by passage. No special tissue affinity
5250	Men., Ab.	9	4	2	Ar., En., P.	7	Ar. 2; En. 2.	
5265	En.	3	1	2	Ar.	—		
5340	Per.	2	—	—		2	Ar.	
20/897	En., life	3	—	—		3	Ar. 2. Fever.	

*Abbreviations: En = endocarditis, Rh = rheumatism, Ab = abscess, Ar = arthritis, Ap = appendicitis, Per = peritonitis, Men = meningitis, P = pericarditis.

A detailed account of the various lesions follows:

1. Joints. In severe cases the sinovial pockets were distended with fluid, the inflammation frequently extending to the bursae and along tendon sheaths. In the most acute cases the sinovial membrane was thickened; it was always inflamed but never necrotic. The overlying skin was never adherent. The fluid was sometimes clear and sometimes muco-purulent, the cell content being chiefly polymorphonuclear, the whole resembling that usually obtained from human cases of acute or sub-acute arthritis of the rheumatoid type except that streptococci were usually demonstrable. Microscopically there was marked thickening of the sinovial membrane with proliferation of connective tissue, some mononuclear and polymorphonuclear infiltration and proliferation of the vascular endothelium. The lesions tended toward complete recovery, except in one chronic case with extensive bony changes.

2. Endocardial lesions. Small nodular thickenings found on the mitral and tricuspid valves, at first thought to be early vegetations, were found also in normal rabbits and in those injected with non-infectious material. There were, however, cases of true endocarditis, with superficial necrosis, erosion and marked proliferation of the endothelium, more or less organised blood clot being present in which streptococci could be demonstrated.

3. Pericardial lesions. Consisted essentially in a marked excess of pericardial fluid, straw colored and usually clear, though occasionally slightly turbid. Fibrinous clots never observed. The cell content of the fluid was chiefly of the small monuclear variety. In all cases except those of post mortem invasion the fluid was sterile.

4. Myocardial lesions. No lesions were encountered in the 17 hearts examined that approximated closely enough the rheumatic nodule seen in human cases to have any diagnostic significance. The most constant change observed was an irregular and variable mononuclear infiltration associated with some proliferation of the fixed connective tissue cells. Polymorphonuclear infiltration was absent or minimal.

5. Appendicular lesions. This occurred only once. Post mortem a narrow band of discoloration was found encircling the appendix at about the junction of its proximal and middle thirds. In this area the peritoneum was acutely inflamed and microscopically the lesion presented all the appearances of a septic infarct. There was almost complete necrosis of the mucosa and submucosa, and to a certain extent of the muscular coat. There was some hemorrhage and marked polymorphonuclear infiltration in the inflamed area and streptococci could be demonstrated there.

It is noted that in all similar work it has been a common procedure to administer intravenously relatively enormous doses of streptococci which were rapidly fatal, the doses being out of all proportion to those received in natural infections. In the present work it is believed that the dosage has been better adjusted (0.3–1.0 cc.). It is pointed out that while lesions producing most of the features of rheumatism as seen in man can be produced by inoculation of streptococci from acute rheumatic cases, similar lesions can be produced with strains from widely different sources. It is thought that the hypothesis that acute rheumatism is caused by a streptococcus which has undergone variation in a special direction receives considerable support from the foregoing experiments, in spite of the fact that in certain cases cultures from joints and other places remained sterile, although the rabbits concerned developed arthritis and a febrile reaction and were killed during the acute stage. It is noted, however, that the streptococci isolated from the lesions of acute rheumatism may be secondary invaders, the true causative organism remaining still to be discovered. The authors believe that if the streptococcus is not the actual cause of rheumatic infection, and if its presence in these cases is not a purely accidental phenomenon, rheumatic fever in the human is caused not by one organism, but by two, working in association with each other. That the presence of the streptococcus in these cases is accidental or unimportant, and that it is only one of several secondary invaders, the authors consider difficult to reconcile with all the ascertained facts.—I. W. P.

2337. Experimental Streptococcus Pneumonia and Empyema. F. P. GAY AND BERNICE RHODES. J. Infect. Dis., Chicago, 1921, **29**, 217–226.

The authors have been able to produce experimental pneumonia in rabbits with great regularity by intrabronchial insufflation of streptococci and pneumococci. Intratracheal insufflation, as described in previous papers, failed, producing only local lesions. Amounts of culture as small as 0.01 cc. would cause pneumonia. The pneumonia thus caused by the pneumococcus was characteristic and differed from the streptococcus pneumonia in the same way as do the human forms of these infections. The streptococcus pneumonia starts as an interstitial lobular form, progressing by direct extension, almost invariably reaching the pleura and causing empyema.

The authors have found that the best results are obtained by growing cultures in rabbit blood or serum broth. Many times the number of organisms which produce infection in these media fail to kill when grown in plain broth.

The organisms after intrabronchial insufflation are at first distributed through the alveoli and the alveolar walls but soon become collected in the perivascular lymphatics and within 24 hours are found in the pleural exudate on the surface of the lung.

By means of an artificial respiration chamber the rapidity of the passage of the streptococci from the lungs to the pleural cavity was determined. Under these conditions cultures of the pleura taken 2 to 5 minutes after the introduction of the bacteria into the bronchi are positive. Under natural conditions, however, the passage of the organisms did not take place so rapidly, several hours being required before cultures were obtained from the pleural surfaces.—L. C. H.

2338. The Effects of Hemolytic Streptococci on the Blood and Hemopoietic Organs of Rabbits. M. S. Tongs. J. Infect. Dis., Chicago, 1921, **29**, 141–150.

Hemolytic streptococci were found to produce a toxic substance which causes degeneration of leucocytes and marrow cells *in vitro*. Intravenous injections into rabbits produce retrogressive changes in the amphophile leucocytes in the circulation and in the marrow cells. Gelatinous degeneration of the bone marrow was also observed. By subacute infections with non-virulent organisms a condition of advanced secondary anemia may be produced.—L. C. H.

2339. Das Verhalten der Körpertemperatur beim Fleckfieber des Menschen und der experimentell infizierbaren Laboratoriumstiere. (The Temperature Curves of Men and Susceptible Laboratory Animals Infected with the Virus of Typhus Fever.) R. Doerr, A. Schnabel and K. Vöchting. Ztschr. f. Immunitätsforsch. u. exper. Therap., Jena, Teil I, Orig., 1921, **31**, 249–278.

The temperature charts of human subjects, anthropoid apes and lower apes, and guinea pigs naturally or experimentally infected with the virus of typhus exanthematicus were compared. A "ground-form" of febrile reaction was thus recognized. In man, the incubation period lasts about 15 days. On the 16th, 17th and 18th days the temperature rises by irregular increments to 40°C. The temperature continues at this level from the 18th to the 27th day, and then returns to normal during an irregular defervescence lasting 3 days. Variations from this typical febrile curve occur, due apparently to racial differences and to differences in the ages of the human subjects, and in the lower animals to the differences in their thermic reactivity to the virus of typhus fever. The incubation period can be shortened to 8 days by the use of a virus which has been passed through guinea pigs.

The great thermic reactivity of the guinea pig can be affected by non-specific stimuli, so that this animal is not well suited to the study of the febrile reactions caused by the typhus virus.

Virulicide sera inhibit the pyrogenic action of the virus of typhus fever in guinea pigs, if the sera are injected at the time of infection or shortly after it. If the virus is thus killed, no active immunity is produced. If the virulicide sera only weakens the virus, a mild and sometimes afebrile infection takes place, permitting active immunity to develop. Protective serum is effective only when injected shortly before or soon after the infection has occurred.—S. B-J.

2340. The Bacteriology of the Blood of Dogs with Eck Fistula. David J. Davis and S. A. Mathews. J. Infect. Dis., Chicago, 1921, **29**, 313–316.

The authors' summary:

Experiments do not indicate that in dogs with Eck fistula bacteria in any appreciable numbers appear in the circulation.

Dogs with Eck fistula are no more susceptible to infection of the lungs or of organs than are normal dogs.

Bacteria disappear from the circulation as rapidly in dogs with Eck fistula as in normal dogs.—L. C. H.

CHEMOTHERAPY

2341. Sobre algunos casos de tuberculosis tratados por el morruinato de sodio. (Some Cases of Tuberculosis Treated with Sodium Morrhuinate.) A. Grapiolo and C. Spada. Rev. Sud-Americana, Buenos Aires, 1920, **3**, 113–120.

The authors describe 10 cases treated with this preparation. They conclude that it has some selective action upon tuberculous lesions but that the local reactions may be serious to the patient. The amount used by Rogers (3 per cent) is too strong and the authors recommend that less should be used.—G. H. R.

2342. Ueber eine kombinierte Behandlungsmethode mit Zucker und Salvarsan, Steyskal-Pranter. (*A Combined Treatment with Sugar and Salvarsan according to Steyskal-Pranter.*) Viktor Pranter. Wien. klin. Wchnschr., 1921, **34**, 183–184.

Salvarsan was dissolved in hypertonic (10:20) glucose solution and administered intravenously. This solution is more stable than the watery, apparently because the reducing property of the sugar protects the arsenical from oxidation. Results from the use of this preparation in numerous cases were encouraging.—B. C.

2343. Zur Behandlung der Zystopyelitis. II. (*The Treatment of Cystopyelitis. II.*) Otto Sachs. Wien. klin. Wchnschr., 1921, **34**, 173–174.

The favorable effect secured in cystopyelitis from intravenous injection of neosalvarsan is ascribed to the formaldehyde component of the neosalvarsan molecule. It is suggested that this component plays an important part in the treatment of syphilis.—B. C.

2344. Die Behandlung der Tabes und Gehirnlues mit Dijodyl. (*The Treatment of Tabes and Cerebral Syphilis with Dijodyl.*) Walther Weigeldt. Deutsche med. Wchnschr., Berl. & Leipz. 1921, **47**, 10.

Dijodyl is the biniodide of "ricin-stearol" acid, and contains 46.2 per cent iodine. It has been found in 6 cases to stop the progress of cerebral syphilis and of tabes for 2 years.—B. C.

2345. Zur Dosierung des Salvarsans. (*The Dosing of Arsphenamine.*) L. Hauck. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 13–14.

Excessive single doses are dangerous and to be avoided. The object in treatment is to provide an adequate *total treatment.*—B. C.

2346. Ueber die einzeitig kombinierte intravenöse Quecksilber-salvarsanbehandlung der Syphilis unter besonderer Berücksichtigung von Novasurol-Salvarsan Mischungen. (*The Simultaneous Combined Intravenous Mercury-Salvarsan Treatment of Syphilis with Special Regard to Novasurol-Salvarsan Mixtures.*) W. Schönfeld. München. med. Wchnschr., 1921, **68**, 197–199.

The simultaneous injection of both medicaments is a desirable procedure. For women and children, neosalvarsan plus mercury is preferred; and for men, silver salvarsan. Permanence of results is still to be determined.—B. C.

2347. Recherches expérimentales sur le traitement de la distomatose par les injections intraveneuses d'émétique. (*Experimental Investigation on the Therapy of Distomiasis by Intravenous Injections of Tartar Emetic.*) Pierre Mauriac and R. Boyer. Compt. rend. Soc. de biol., Par., 1921, **85**, 917–919.

Infected sheep were given intravenous injections of tartar emetic. Contrary to previous reports, the method of treatment did not appear to be efficacious.—G. H. S.

2348. Ueber das Wesen der intravenösen Sublimat-Salvarsan-einspritzungen nach Linser. (*The Character of the Intravenous Injection of Sublimate-Salvarsan of Linser.*) Stephan Rothman. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 71–72.

In the mixing of salvarsan with mercuric chloride metallic mercury is precipitated secondarily, while the reduction produces calomel. The oxidation of the salvarsan in this process must be comparatively small. The favorable therapeutic action of the mixture is due presumably to the colloidal metallic mercury and perhaps also to the change in dispersion of the salvarsan.—B. C.

2349. Ueber eine neue Modifikation der Hg-Salvarsantherapie: Behandlung durch Neosalvarsan und Cyarsal in Mischspritze. (*A New Modification of Hg-Salvarsan Therapy: Treatment with Neosalvarsan and Cyarsal in the Mixing Syringe.*) F. W. Oelze. München. med. Wchnschr., 1921, **68**, 271–272.

Cyarsal is the potassium salt of a mercury compound of oxybenzoic acid, containing about 46 per cent Hg. One valence of the Hg is firmly bound to the carbon of the nucleus and the other to the isocyanide group. Neither ammonium sulfide nor salvarsan is able to split off this mercury. The crystalline compound is soluble in water and can be administered simultaneously with salvarsan. The immediate effects upon syphilis in 1200 cases have been encouraging.—B. C.

2350. Experimentelle Untersuchungen zur Salvarsantherapie der Paralyse. (*Experimental Studies on the Arsphenamine Therapy of General Paralysis.*) R. Weichbrodt. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 69–71.

After intravenous injection of arsphenamine preparations arsenic is to be found in the blood and the spinal fluid in a very short time. The amount of arsenic is about equal in both fluids. Arsenic is also to be found in the brains of those receiving treatment with arsphenamine. It is believed that comparative tests on animal brains should determine the value of new arsenic preparations.—B. C.

MISCELLANEOUS

2351. *Experimental Studies on Inflammation. I. The Influence of Chemicals upon the Chemotaxis of Leucocytes in Vitro.* Elizabeth Pauline Wolf. J. Exper. M., Balt., 1921, **34**, 375–396.

The influence of a large number of chemicals upon the migration of leucocytes *in vitro* was determined. Wright's method (A. E. Wright, Lancet, 1918, 1, 129) was used. The author makes the following conclusions:

"1. Wright's method for the study of chemotaxis of leucocytes *in vitro*, slightly modified, has been found to be most satisfactory in the estimation of the degree of chemotaxis of various substances, because it is possible to make an exact quantitative determination of the leucocytes that have migrated from the blood clot and adhered to the surfaces containing the tested substance.

"2. The calcium ion is the only inorganic ion *per se* which was found to be positively chemotactic under the conditions of these experiments. It is markedly chemotactic in all concentrations and in all combinations, except the citrate. Here the negative chemotaxis of the citrate ion neutralizes the positive chemotaxis of the calcium ion, and neutrality of chemotactic effect results.

"3. The sodium and magnesium ions themselves are neutral. Magnesium and sodium salts are dependent upon the negative ion with which the magnesium or sodium is combined for such positive or negative chemotaxis as is exhibited. All the phosphates of sodium, whether tri-, di-, or monobasic salts, are markedly positively chemotactic, and when combined with other reagents which are themselves neutral or negatively chemotactic, produce marked positive chemotaxis. The blood of a person who has taken phosphates either by mouth or intravenously shows a great increase in chemotaxis with sodium phosphate, with calcium chloride, and even with sodium chloride which is ordinarily neutral.

"4. All potassium salts are negatively chemotactic.

"5. Many substances act synergistically as regards chemotaxis; e.g., when strontium and magnesium salts are mixed there is a marked increase in chemotaxis. Sodium phosphate acts synergistically with calcium chloride.

"6. Mercury salts fix the leucocytes in this method so that their influence on chemotaxis cannot be determined.

"7. Morphine and morphine salts are positively chemotactic; this is contrary to the results obtained by others with different methods.

"8. Substances which produce a very acute inflammation, such as cantharidin, histamine, or turpentine, are found to be positively chemotactic by this method, but substances, such as mustard gas, which produce a marked necrotizing effect are found to be negatively chemotactic, or neutral, though physiologically they would appear to be positively chemotactic.

"9. All amino-acids and amines are positively chemotactic to a certain extent. It seems that the longer the carbon chain the greater the degree of chemotaxis, though this not absolute. Tyramine is one exception to this, for it causes a peculiar clumping of the cells, so that it is impossible to count the number adhering, and thus determine whether or not tyramine is positively chemotactic.

"10. The time that the blood of animals is examined after eating makes a marked difference in the number of cells adhering, for shortly after eating, within 30 minutes, very many more cells will adhere to the agar than at a later time.

"11. The blood of different species of animals reacts differently towards different reagents. The chemical composition of these agents seems to have nothing to do with this difference in reaction as far as we could determine.

"12. With frozen serial sections it has been found that the depth of penetration of the leucocytes into the agar is proportional to the positive chemotaxis produced by the substance combined with the agar, as demonstrated by the number of leucocytes adherent to the walls of the test chambers."—C. G. B.

2352. *Epinephrine Hyperglycemia. I.* Arthur L. Tatum. J. Pharm. & Exp. Therap., Balt., 1921, **17**, 395–413.

From a review of the literature and from personal experiments Tatum concludes that epinephrine hyperglycemia is not the result of hepatic asphyxia or acidosis but that these conditions are of independent origin; as yet the process whereby epinephrine brings about glycogenolysis is undetermined.—F. W. H.

2353. *The Size of Red Blood Cells in Emphysema.* Cecil Price-Jones. J. Path. & Bacteriol., Edinb., 1921, **24**, 326–332.

Twenty-two cases of emphysema were examined, 16 males and 6 females, the ages ranging from 35 to 100 years. In 13 cases the condition was associated with chronic bronchitis, but in no case was there any sign of circulatory failure. Twenty healthy controls were also examined, 19 males and 1 female, the ages ranging from 19 to 90 years. In view of the diurnal variation in the size of red blood corpuscles, all specimens of blood were taken about 11 a.m. and 500 cells were measured in each case.

It was found that the mean diameter of the red cells in the 22 cases of emphysema was 7.69 microns, while that of the normal controls was 7.24 microns, a difference of 0.45 micron, which is regarded as significant. There was no important difference in the red cell diameters of younger people and those of advanced age, but among the cases of emphysema the bedridden, numbering 10 with a mean age of 71 years, had a mean diameter value of 7.59 microns, while those not confined to bed, numbering 12 with a mean age of 56 years, had a mean diameter value of 7.77 microns. The diurnal variations in the diameter of red cells seen in healthy people was also observed in the emphysema patients.

The author has noted that when the carbon dioxide of the alveolar air is diminished through forced breathing the mean diameter of the red cells is also diminished. To determine whether impairment of respiratory exchange in cases of circulatory failure would produce a similar increase in red cell diameters, 15 cases of heart disease were examined, all suffering from varying degrees of heart failure associated with dyspnoea, cyanosis and venous congestion, the ages ranging from 11 to 67 years. The mean diameter value of these cases was found to be 7.22 microns, not significantly different from the normal controls. It is thought that the increased size of the red blood cells in cases of emphysema is associated with an increased quantity of carbon dioxide in the blood, in spite of normal reaction, and that carbon dioxide has a special swelling action on the corpuscles out of proportion to its acidity.—I. W. P.

2354. On Acute Yellow Atrophy of the Liver and the Fatty Infiltration of the Liver and Kidney which Results from the Action of Certain Poisons on the Liver. ALEXANDER G. R. FOULERTON. J. Path. & Bacteriol., Edinb., 1921, **24**, 257–271.

The observations in this paper are based on material from 3 cases of poisoning by trinitrotoluene, 7 by arsenobenzol compounds and single caases of poisoning by "Blue Cross Gas" (diphenylchlorarsine), tartrate of antimony and perchloride of mercury. In addition there was some animal experimentation in poisoning with trinitrotoluene, arsenic oxide, novarsenobillon and kharsivan, and ortho-amido-phenol, besides a few experiments with saponin, a glucoside which seems to have a special action on the liver.

Both in the spontaneous human cases and the experimental animal ones, there were found certain common changes in the liver and kidneys. There was always an interstitial hepatitis and almost always an acute nephritis, both changes varying in intensity with the type of poison and the method and time of administering it. With each poison also there was more of less fatty infiltration of the liver, unchanged fat being found in the kidneys. The fat in the liver varied from minute globules distributed through the areas of periportal round cell infiltration to massive infiltration of the whole gland. In the kidneys it varied from a scanty distribution, chiefly in the convoluted tubules, to massive engorgement of the organ. Fatty changes in the liver not hitherto recorded are here described in the case of a man dying of perchloride of mercury poisoning.

In connection with various forms of arsenic poisoning, the slow rate of elimination of the arsenic from the body is noted, other work being quoted to show that it can be detected in the urine over a period of weeks. In these cases the pathological picture is somewhat confused by the active hemolysis which occurs. In the single case of poisoning from "Blue Cross Gas," the acute effects did not make their appearance until a week before death, twelve weeks after the poisoning had occurred; in this case it seemed obvious that the liver changes considerably antedated the onset of symptoms, suggesting that there may be considerable disturbance of the fat-metabolizing function of the liver without any immediate and obvious effect on the general health.

In cases of experimental poisoning with ortho-amido-phenol and saponin, in addition to the usual hepatitis and nephritis, there was present, in the spleen, a dark brown pigment in large masses, probably the same observed in the organs and urine in cases of poisoning with trinitrotoluene. In poisoning with ortho-amido-phenol the renal epithelium was stained brown by this pigment. Rabbits dying after small subcutaneous doses of saponin showed enlargement of the liver with inflammatory changes and fatty infiltration of the liver and kidneys.

It is thought that the fat observed in the liver in these cases represents not an essential fatty degeneration of the liver cells, but merely food fat brought to the liver by the blood, accumulating there because the already injured liver is unable to deal with it. Some of this excess of unchanged fat is eliminated by the kidneys, in the course of which there is produced a fatty engorgement of those glands. Since most of the poisons mentioned have a special affinity for fats, the reason for the severe injury to those organs where most of the fat is stored is obvious. Carried in the food fat, the poison becomes increasingly more concentrated in the liver until hepatitis and hepatic insufficiency result. The heavy concentration of arsenic in the adrenals in cases of experimental poisoning suggests a possible affinity also with fats other than the glycerides of the higher fatty acids. Of the poisons that cause a fatty infiltration of the liver and kidneys several groups are mentioned, in their chemical relation to fats.

1. Active fat solvents—chloroform, ether and tetrachlorethane.
2. Fat-soluble benzene derivatives—dinitrobenzene and trinitrotoluene.
3. (a) Fat-soluble phosphorus, and the chemically related

(b) Antimony, arsenic, and mercury. These three have no special affinity for fats in the way of solubility in or solvency for them, although combination in the form of an oleate is possible for all three. However, the case of perchloride of mercury poisoning, with fatty infiltration of the liver, is recalled, though there was no evidence that the mercury was concentrated in the liver in any special combination with fat, while with antimony and arsenic such combinations had probably occurred. The relatively high concentration of arsenic in the bones, presumably in the marrow, would account for its therapeutic effect in certain anaemias, the irritant action of the drug stimulating the marrow to greater red cell production.

Cases of delayed poisoning are briefly discussed. It is pointed out that in cases where fat-soluble poisons have been stored in the body tissues, any variation in the nutrition of the patient, such as would follow discharge from hospital confinement, would set free for use in the body some of the stored fat, with consequent liberation of some of the fixed poison, which would then be carried with the fat to the liver. Delayed poisoning would then result. It is noted that arsenic has been found in the urine 21 to 63 days after a single large dose of white arsenic had been administered, indicating that it had beeen stored in the tissues and was being very slowly eliminated.

Estimations of the fat content and the arsenic content of the organs of rabbits poisoned with large doses of arsenic bear out the theory of the fixation of arsenic by fats and lipins.—I. W. P.

2355. The Multiplication of Fibroblasts in Vitro. Alexis Carrel and Albert H. Ebeling. J. Exper. M., Balt., 1921, **34**, 317–337.

Experiments were performed for the purpose of determining the source of the substances used by the fibroblasts of tissue cultures in adult plasma and of cultures in plasma to which embryonic juices are added. It was found that the growth of cultures in adult plasma depends upon a small amount of embryonic juice in the tissue itself and is not due to the serum. In cultures in adult plasma to which embryonic juices have been added growth is supported by the embryonic juice alone, neither the serum nor the fibrin furnishing food material to the growing cells. The rate of growth is directly proportionl to the amount of embryonic juice present.—C. G. B.

2356. Spiral Bodies in Bacterial Cultures. Laura Florence. J. Bact., Balt., 1921, **6**, 371–377.

Recently Koga and Otsubo (J. Infect. Dis., 1919, **24**, 56) have described the occurrence of spiral bodies in bacterial cultures as an apparently new observation. In this paper the author points out that it has been reported upon thoroughly and variously by many writers from Loeffler (1889) to Friedberger and Pfeiffer (1919). The author has found these spiral bodies in the condensation water of agar slant cultures of 5 motile strains whether cultured in sealed or unsealed tubes. They are demonstrable in smears stained by Loeffler's method, in hanging drop preparations (but not in those smeared and stained with methylene blue or carbol fuchsin), and were not found in preparations following Johnston and Mack's procedure. Apparently these spiral bodies degenerate and disappear quite readily. Their non-motility and reactions towards stains differentiate them definitely from spirochetes. Their presence in cultures of motile organisms only suggests a relationship with the flagella. They probably are lifeless structures. They have not been obtained in pure culture and hence are considered to be cast off or broken off flagellar structures.—I. S. F.

2357. Measurement of the Growth of Tissues in Vitro. Albert H. Ebeling. J. Exper. M., Balt., 1921, **34**, 231–243.

A method is given by which equal growth of two fragments of tissue in the same medium may be obtained and also a method of measuring the growth.—C. G. B.

2358. Erfahrungen mit Heilners Knorpelextrakt "Sanarthrit." (Experience with Heilner's Cartilage Extract "Sanarthrit.") Erich Sonntag. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 233–234.

The results in 20 cases of arthritis are communicated. It would appear that sanarthrit accelerates healing.—B. C.

2359. Ueber abortiven Abbau des fibroelastischen Gewebes der Haut. (Abortive Formation of Fibroelastic Tissue of the Skin.) P. Grawitz. Virchow's Arch. f. Path. Anat. (etc.), Berl., 1921, **232**, 35.

The author takes a stand against the leucocytic doctrine of elastic tissue formation.—S. A. G.

BOOK REVIEW

2360. Lehrbuch der Milchwirtschaft. (Textbook of Dairy Farming.) Franz Lauterwald. 2d Ed. 8°, XI + 458 p. Hannover (M. A. H. Schaper) 1920. (Centralblb. f. Bakteriol. (etc.), 2. Abt., Ref., 1921, **54**, 125–126.)

This is a book designed primarily for practical purposes and can also be of great service in scientific dairying.—S. A. W.

PROCEEDINGS

Proceedings of the Pathological Society of Great Britain and Ireland. July 8 and 9, 1921. J. Path. & Bacteriol., Edinb., 1921, **24**, 355–368.

2361. Differences in the Character of Hemolytic Immune Sera of Different Origins for Sheep Corpuscles and on the Mechanism of Heterophile and Isophile Cytolysis:—The Separation of Combining and Antigenic Properties. Tenji Taniguchi.

A comparison has been made between the properties of sheep hemolysins developed by injecting (a) organs of certain animals, e.g., guinea pig kidney, etc., and (b) sheep corpuscles into rabbits, and (c) sheep corpuscles into guinea pigs.

The antiserum obtained by injecting fresh sheep corpuscles into the rabbit contains two different kinds of thermostable sheep hemolysin; the one of which is of heterophile and the other of isophile type. The presence of heterophile antibody is shown by the fact that this immune serum possesses in enhanced degree the power of fixing complement along with alcoholic extracts (lipoids) of heterogenetic tissues; it also precipitates these lipoids. Heterophile antibody forms a large proportion of the antisubstance generated by a single injection of sheep corpuscles. After multiple injections it is relatively less abundant than isophile antibody.

Since the heterophile antigen resists prolonged boiling and the receptors are present in alcoholic extracts, lipoids appear to be an essential constituent of the receptors of sheep corpuscles concerned in heterophile antiserum hemolysis; while those acted upon by isophile immune body are supposed to be of protein nature.

A point of great importance in connection with the theory of antigens is that the lipoids of heterophile tissue, while capable of reacting specifically with heterophile antibody *in vitro*, are practically devoid of the power of generating antibody in rabbits. Thus it appears that a dissociation has been effected between the combining property and the antigenic power of heterogenetic tissues. Tissues from which the lipoids have been extracted also fail to act as antigens *in vivo* as well as *in vitro*.

There are pronounced differences in the behavior of the complex, consisting of heterophile and isophile antibody respectively, with sheep corpuscles, viz., (a) sheep corpuscles fix far larger multiples of the M. H. D. of sheep hemolysin of heterophile type (over 30) than isophile type (4–6 cause saturation); (b) the combination of heterophile immune body with sheep corpuscles is firmer than that of isophile immune body; thus dissociation of immune body from sensitized sheep corpuscles into fluid media or its transfer to intact corpuscles occurs to a less extent in the case of heterophile than of isophile immune body; (c) when the same number of doses are used for sensitizing the corpuscles, the heterophile immune body possesses the capacity to fix more complement along with sheep corpuscles than does the isophile immune body; this is apparent even when the number of doses employed is such as yields less than one dose over in the case of isophile antibody.

The hemolytic complement contained in fresh guinea pig serum possesses the capacity to lyse the specific precipitate which has been formed by the reaction of the lipoids of sheep corpuscles with heterophile immune body. This suggests strongly that here one is actually observing the mechanism of the cytolysis effected by such heterophile immune body.—I. W. P.

2362. *On Heterophile Anaphylaxis.* TENJI TANIGUCHI.

It has been observed that in certain cases symptoms apparently of anaphylactic character are produced by injecting into guinea pigs the antisera obtained by treating rabbits with a variety of tissues. These tissues are invariably such as generate in the rabbit heterophile hemolysin for sheep corpuscles. It is to be noted that the guinea pig's tissues also contain heterophile antigen. The analysis of this phenomenon has led to the following conclusions.

1. The anaphylactic symptoms caused by parenteral administration of heterophile antisera into animals which contain heterophile antigen in their tissues, should be attributed mainly to the interaction between heterophile antigen and antibody so introduced, although the antisera may also contain other molecules which are toxic to the animal in a minor degree.

2. As has been seen, the specific receptors for heterophile antibody reside in the lipoid constituents (lecithin fraction) of heterophile tissues. Watery suspensions of untreated heterophile tissues also exhibit specific reactions with heterophile antibody (complement fixation, etc.), but proteins from such tissues, which have been deprived of their lipoid constituents, lack the property. Thus it is suggested that the molecules that react specifically with heterophile antibody *in vivo* are lipoids or lipoid-protein compounds, but not proteins free from lipoids. Hence the mechanism of heterophile anaphylaxis is distinct from that of true anaphylaxis, where the specific receptors for the corresponding antibody are supposed to be proteins. The development of anaphylactic shock by the reaction of specific lipoids and corresponding antibody would thus be established for the first time in the case of heterophile anaphylaxis.

3. Normal sera of certain animals (man, rabbit, pig, etc.) contain a varying amount of heterophile antibody; thus conditions for heterophile anaphylaxis are provided when such sera are injected into suitable animals (e.g., guinea pig, etc.).

4. The question arises as to whether heterophile anaphylactic reactions may also develop as the result of injecting heterophile antigens (horse serum, certain kinds of bacteria, etc.) into the human subject where naturally a variable amount of heterophile antibody is present.—I. W. P.

2363. *The Syphilis Precipitation Reaction of Sachs-Georgi.* N. YOSHINARI.

Precipitum formation is observed when syphilitic serum (previously heated at 56°C. for 30 minutes) is mixed in appropriate amount with a suitable lipoid emulsion in saline, e.g., alcoholic extract of human heart to which cholesterol has been added, and the mixture is allowed to stand in the incubator 18–20 hours at 37°C—.the Sachs-Georgi reaction (for practical details see Taniguchi, 1921). The following points have been investigated:

1. The Difference Between Negative and Positive Sera. A series of sera which reacted negatively in the Wassermann test, and also gave a negative Sachs-Georgi reaction when tested in the usual amounts (0.05 and 0.1 cc.) were examined. Larger quantities (0.2 and 0.3 cc.) were used and it was found that 7 out of 14 sera then caused precipitation (among them

one known non-syphilitic serum). Hence it appears that the concentration of serum used in the Sachs-Georgi test is of great importance, as probably many non-syphilitic sera may react positively if used in too high concentration. The failure to demonstrate a positive type of Wassermann reaction with large amounts of heated non-syphilitic serum may be due in part to the inhibitory action of the serum by itself on complement masking the effect.

2. Differences in Reacting Properties of Heated and Unheated Sera and Cerebrospinal Fluids. It has been frequently observed that strongly reacting sera when tested unheated in the usual amounts give a weak or even a negative Sachs-Georgi reaction. On performing the test with an extended range of concentrations it is found that while syphilitic sera, both heated and unheated, show a zone phenomenon, certain sera in the unheated state fail to cause precipitation in any concentration, but after heating react strongly positive in the usual concentrations. Heating at a higher temperature (62°C.) is more harmful to the manifestation of the Wassermann reaction than to the Sachs-Georgi reaction. In a small series of cerebrospinal fluids, which reacted positively, when unheated, both to the Wassermann and to the Sachs-Georgi tests, heating to 56°C. for 30 minutes did not enhance the precipitating power as tested with varying concentrations of fluid.

3. Effects similar to that of heating serum, as regards the Sachs-Georgi reaction, are brought about by filtering unheated serum through a washed Berkefeld candle or by mixing the serum (2.5 cc.) with powdered filter (1.0 gram) and allowing to stand for 10 minutes at room temperature, i.e., the filtered or treated serum reacts more strongly than the original fresh serum (the slight degree of increased alkalinity imparted to the serum by this treatment is not responsible for the change in its behavior). Heating at 56°C. for 30 minutes after such treatment does not cause any further change. The result does not appear to be due to the removal of hemolytic complement, since if the filtrate is collected in portions, the later fractions, which may be practically equal to the unfiltered serum in complement content, behave like heated serum in the Sachs-Georgi test. Further, absorption of the complement from an unheated syphilitic serum by means of sensitized heated stromata of ox blood does not cause it to behave like heated serum, although the treated serum responds to subsequent heating. Negative sera do not yield precipitates in the Sachs-Gergi test when employed in the usual amounts after filtration in the unheated state, or after subsequent heating.

4. Discrepancies Between the Results of the Wassermann and Sachs-Georgi Reactions. 1575 sera were tested. With known syphilitic cases that have undergone specific treatment, there is a larger proportion of discrepances than is yielded by the other series (of the above 1575 sera, 963 were from untreated and 316 from treated cases), due mainly to the occurrence of positive results with the Sachs-Georgi test where the sera yielded a negative or suspicious Wassermann reaction. Other observers have come to a similar conclusion. (See Dreyer and Ward, 1921; Baumgaertel, 1921, etc.). But the fact must not be neglected that certain sera which give a marked positive Wassermann reaction may fail to cause precipitation in the Sachs-Georgi test.

The Wassermann tests were carried out as described in Browning and Watson's "Venereal Diseases," London, 1919, using human heart cholesterol antigen.—I. W. P.

2364. Differentiation of the Streptococci. H. Warren Crowe.

A differential medium for streptococci, shown at the last meeting, was again brought to the notice of the Society. Photographs of various streptococcus colonies were shown in order to demonstrate the ease with which their distinctive characters can be recorded.

The results in a brief study of 5 streptococci are presented in a table. Two were isolated from an apical infection of a tooth and 3 from the sputum in chronic bronchial catarrh. None was bile-soluble, all fermented saccharose and none mannitol, but with raffinose, salicin and inulin the fermentation reactions varied. Litmus milk was acidified and coagulated, late in one case. Pathogenicity experiments with mice and rabbits were not altogether conclusive and would have been repeated if possible, but it was fairly clear that none of the strains possessed a high pathogenicity, for these animals. The medium used for fermentation reactions was Hiss's serum water, to which were added the desired sugars and 10 per cent of boiled blood filtrate, prepared by boiling one part of defibrinated blood with three parts of water and autoclaving the filtrate.

It was found that with dental infections, except gross purulent lesions, a single variety of streptococcus was never present in pure culture. Streptococci only could be found if extreme care was exercised to avoid mouth contamination, but never less than three varieties. They were isolated from the apex, of the freshly extracted tooth, removed aseptically under local anaesthesia, and in one case 12 different varieties were found.

The formula and preparation of the medium used for isolation are as follows:

About 1 liter of defibrinated bullock's blood is strained through muslin; 750 cc. is placed in a water bath at 50°C., 250 cc. of peptone or trypsin agar of the usual reaction is melted and cooled to 50°C., and the two are mixed; 1 per cent of glucose is added and the mixture is maintained at 50°C. while plates or tubes are filled. At least ¼ inch is required in each plate. The medium becomes semi-solid and is placed, without tilting, in a steam sterilizer where the temperature is kept at 65–70°C. for an hour or two and then at 80–90°C. on 3 successive days. The temperature must not be allowed to go to 100°C. or the surface of the medium will be ruined. Plates should keep 3 weeks at room temperature and longer in the ice box. It is very important that the medium should not be scratched or roughened during inoculation. To prevent this a fine piece of glass rod, carefully cleaned before sterilizing, must be used—never a platinum loop.—I. W. P.

2365. *Diffuse Carcinomatosis of the Stomach with Metastases.* G. MARSHALL FINDLAY.

The patient was a man of 42, a post-office sorter, who had been in good health up to the end of November, 1920. He then began to have pain in the back, in the thoracic region, and shooting pains down both legs. He gradually lost weight and became anemic, with a red blood count of 2,000,000 per c. mm. and a color index of 0.75. He died March 29th, 1921.

The autopsy findings were as follows:

Lymphatic glands along the lesser curvature of the stomach were enlarged and matted together; on section they were white.

The stomach showed two small areas near the cardiac end of the lesser curvature, where the mucous membrane had lost its normal rugose appearance. There was practically no thickening of the stomach wall and no ulceration.

The spleen was moderately enlarged, deep red and very friable. There was no perisplenitis, and on gross examination no apparent neoplastic involvement.

The liver showed scattered throughout its substance a few small whitish nodules about the size of a split pea.

The left adrenal was not enlarged, but on section the proportion of medulla to cortex seemed to be increased.

In relation to the anterior aspects of the bodies of the seventh, eighth, ninth and tenth thoracic vertebrae there were found numerous nodules, the largest about the size of a pigeon's egg, while smaller oval growths were present in relation to the ribs.

Microscopic changes:

The stomach wall showed a diffuse infiltration with cells of epithelial type, there being no attempt at acinar formation. At points corresponding to the smooth areas the mucosa and submucosa were entirely replaced by tumor cells, while the muscular and serous coats were also extensively involved; at other points, where grossly the mucous membrane appeared normal, the mucosa and submucosa were infiltrated with new growth. The extension of this growth could be well seen in the muscularis mucosae, whence it spread upwards between the deep glands of the mucosa which were undergoing atrophy. Most of the tumor cells were small with comparatively little protoplasm, but a few larger cells with granular protoplasm were present, some of them multinucleated and many containing acidophile bodies.

In the lymph nodes the tumor cells were on the whole larger than those in the stomach, multinucleated cells with hyperchromatic nuclei being common. The splenic tissue was almost entirely replaced by tumor cells, resembling those in the lymph glands. In the liver, the cells in the small whitish nodules showed a tendency to alveolar arrangement, while the intralobular sinusoids contained numerous tumor cells. In the bodies of the vertebrae the cancellous tissue was replaced by new growth, large multinucleated cells with hyperchromatic nuclei being the predominant feature. The medulla of the left adrenal was replaced by tissue which at first sight might have been taken for a hyperplasia of the medullary tissue, but which on closer examination was found to be composed of cells resembling those found in the stomach. Cell inclusions were common and at certain points the adrenal cortex was being actively infiltrated.

The right adrenal, kidneys, pancreas, prostate, lungs, bone marrow and spinal cord were normal. The striking points in the tumor are:

1. Extensive infiltration of the stomach wall with little macroscopic change and no gastric symptoms.
2. The secondary anaemia.
3. Infiltration of the left adrenal which might have been mistaken for a primary tumor of the adrenal medulla.
4. The secondary involvement of the spleen.—I. W. P.

2366. *Aldehydes as Mordants in the Staining of Fats and Lipins.* J. LORRAIN SMITH AND THEODORE RETTIE.

In the staining sections of spinal cord by Weigert's myelin method it was found that in the routine use of formaldehyde there resulted not only general fixation of the tissue but also a definite mordanting effect on the myelin of the nerve sheath. This effect has been observed by histologists, but no attempt has been made to determine the conditions in which it takes place.

It was found that aldehydes other than formaldehyde also acted as mordants, and that simple fat, as well as myelin and other lipins could be stained. Observations on tissues were made with formalin-fixed material, as this gave the most satisfactory results.

Method 1. Formaldehyde. The solution of formaldehyde used must contain paraformaldehyde. This may be added in solid form, or a solution which has been kept until some paraformaldehyde has precipitated may be employed. Formalin full strength (40 per cent formaldehyde) is used, and frozen sections are treated in this solution at 37°C. for 2–3 days: washed in water: stained in Kulschitsky's solution of hematoxylin (1 per cent hematoxylin in 2 per cent acetic) for 12–24 hours; differentiated in Weigert's borax ferricyanide solution (1.5 per cent ferricyanide of potassium and 1 per cent of borax); diluted with 20 volumes of water. Counterstaining is not necessary and tends to mask the finer granules. By this method myelin sheath of nerve, myelin in adrenal, lipin deposit in atheroma are stained dark blue. Fat globules in degenerating liver, kidney, heart, etc., are also stained dark blue. Fat in adipose tissue is slightly stained in recently fixed tissues, but if the sections have been kept in formalin for a long time the staining of this fat also is intense. Cell nuclei are stained, and red blood corpuscles are also stained though not invariably.

Method 2. Acetaldehyde. The action of acetaldehyde is much more selective than that of formaldehyde, and it is advantageous to vary the strength of the mordant according to the elements which are to be stained. A solution is made up containing acetaldehyde 10 per cent, paraldehyde 1 per cent, caustic soda being added until the solution is just acid to litmus paper. Frozen sections are treated in this solution at 37°C. for 3–5 days and stained and differentiated as in Method 1. Fat globules in degenerating tissue stain intensely blue sometimes after 24 hours, but sometimes only after several days. Fat in adipose tissue stains in 24 hours only slightly or not at all. Myelin stains, but not so readily as with Method 1. Degenerating myelin, and especially that contained in the compound granular corpuscles, may be demonstrated by using stronger solutions (20 per cent) of the acetaldehyde. At the same time with this strength of mordant the normal myelin fails to stain.

Several points are noted:

1. In a saturated aqueous solution benzaldehyde acts as a mordant of fat and myelin, but the staining is not so intense or regular as that obtained with formaldehyde and acetaldehyde. No staining of fat is seen after treatment with furfuraldehyde.
2. Pure aldehyde solutions do not mordant, the presence of a polymerised aldehyde being necessary. The polymer need not be derived from the same aldehyde.
3. Fat globules in the liver and kidney of rats, mice, guinea pigs and rabbits do not react readily; myelin in the adrenal stains with comparative intensity.
4. The reaction takes place at room temperature, but much more rapidly at 37°C. Direct sunlight also accelerates the reaction.

A further communication will be made on this subject.—I. W. P.

2367. *The Production of Purpura in Birds and Amphibia by Inoculation with Thrombocyte Antisera.* J. C. G. Ledingham and H. M. Woodcock.

These experiments were undertaken in an effort to determine whether, as has been suggested, the nucleated elements, or thrombocytes, present in bird blood have a function in the mechanism of coagulation analogous to that of the mammalian platelet. Thrombocyte emulsions were prepared from citrated or oxalated pigeon blood by a process of fractional centrifugalization. Owing to the small number of thrombocytes in pigeon blood relatively to that of platelets in mammalian blood (40,000 thrombocytes per c. mm. as compared to 600,000 in the guinea pig) it was difficult to secure enough thrombocytes. Rabbits were immunised with the emulsions and their sera tested *in vitro,* for agglutinating action on bird blood elements and *in vivo* to determine whether evidence of selective action on the thrombocytes, with consequent purpuric manifestations, could be observed. It was found that subcutaneous injection of the antithrombocyte serum was followed in 24 hours by a local purpuric eruption which cleared up in 5–6 days. Intraperitoneal injection of the serum caused a more rapid production of purpura confined, as far as the naked-eye examination went, to the vascular mesenteric tissue and the fatty tissue surrounding the gizzard. Skin purpura was present only in the neighborhood of the initial puncture. Blood examinations following inoculation pointed to selective action on the thrombocytes; in 24 hours thrombocytes and their probable precursors, the hemoblasts, fell to minimal numbers, the fall in each case being followed by a gradual rise to figures exceeding the normal. Within 10 days the normal formula was usually established.

In frogs encouraging results have also been obtained, but in these animals the difficulty of securing strong emulsions of thrombocytes, or "spindle cells," has not yet been completely overcome.—I. W. P.

2368. *Acute Nephritis in Pyococcal Infections.* J. Shaw Dunn and A. P. Thompson.

In the course of 660 autopsies there was pathological evidence of acute nephritis in the kidneys of 13 cases. In most instances the kidneys showed well-marked gross changes, enlargement, pallor and punctiform hemorrhages in the cortex. Histologically they could be divided into two groups in accordance with the glomerular changes:

Group 1. Showed a focal distribution of miliary thrombi in glomerular capillaries, usually associated with little reaction. The parts of tufts not occupied by thrombi, and also many whole glomeruli, were normal.

Group 2. Showed diffuse intra-capillary glomerulitis in varying degrees. The capillaries of all the tufts were dilated and filled with excess of thickened endothelial cells and leucocytes; thrombi were also present in some instance. In two cases only there was well-marked catarrh of the capsular epithelium with crescent formation.

In both groups tubular hemorrhages were frequent. The amount of damage of tubular epithelium varied greatly and was often not marked.

The 13 cases from which these kidneys were taken were all primarily cases of serious septic infection, 8 from streptococcus, 1 from pneumococcus and 1 from *Staphylococcus aureus.* The cases were distributed as follows;

Ulcerative endocarditis	6
Otitis media, with complications	3
Septicemia	2
Emypema	1
Retroperitoneal cellulitis	1

In 8 cases in which the urine was examined, blood was present in 4 and albumin without blood in 4. The definite nephritic symptom of edema was present in only 2 cases. Only 1 case was diagnosed clinically as an acute nephritis, and there it was regarded as a secondary development in the course of a septicemia.

From a consideration of these cases it would appear that while ordinary septic infections may fairly frequently give rise to the pathological lesions of acute nephritis, it is comparatively seldom that this nephritis results in edema or other symptoms of renal insufficiency, even when the renal lesion is a true intracapillary glomerulitis.—I. W. P.

2369. Crystalline Hemoglobin as a Stimulant of Foreign Body Giant Cell Reaction in the Guinea Pig. M. J. Stewart.

Sections were shown from a hematoma in the broad ligament of a guinea pig which had been inoculated intraperitoneally with cerebrospinal fluid 28 days before. It was killed as a matter of routine for the diagnosis of tubercle, with negative results, and the only pathological finding was a small, firm, dark red hematoma, evidently of some standing, in the right broad ligament. This nodule, measuring a little under ¼ inch in diameter, showed on section a dark red, sharply defined margin and pale center.

Microscopically there was a large central mass of disintegrating and decolorising blood clot, at the periphery of which was a narrow zone containing numerous right, orange-colored, tetrahedral crystals of various sizes. Outside this was a zone of recent fibroblastic and endothelial cell reaction, much infiltrated with blood and shutting off the hematoma from the surrounding adipose tissue. Some of the crystals were embedded in this outer reactive layer, and many of them were surrounded, wholly or partly, by large, multinucleated foreign body giant cells. These cells, as well as many of the endothelial cells, contained numerous dark, greenish-brown granules giving the Prussian-blue reaction (hemosiderin). The tetrahedral crystals, which were unaffected by hydrochloric acid and potassium ferrocyanide, had the typical character of guinea pig hemoglobin.

The specimen illustrates the occurrence of the foreign body reaction in response to an unusual stimulus, crystalline hemoglobin, and one which, so far as the author is aware, has not been observed in the human subject. This is doubtless accounted for by the fact that guinea pig hemoglobin cystallizes out very readily, that of man only with great difficulty. Another point of interest is that the conversion of hemoglobin into hemosiderin is evidently occurring mainly, if not entirely, within the giant and endothelial cells.

The hematoma probably resulted from wounding of the broad ligament at the time of inoculation, and the age of the lesion was therefore 28 days.—I. W. P.

2370. Adenocarcinoma of the Ovary in a Hen. Clara Stewart.

The fowl, a Leghorn, was hatched in May, 1919, and began to lay in October of that year. Laying probably continued until about October, 1920. She was first noticed to be ill about the beginning of January, 1921, soon after which she became thin and would not eat, while there was increasing pallor of the comb. The tissues around the vaginal orifice became swollen and hard, and very soon the hen was unable to walk about. Death occurred in May, 1921.

Post-mortem Examination. The peritoneum, especially the visceral layer, was studded with innumerable white deposits of new growth measuring from 1/20 to ¼ inch in diameter and most abundant on the mesentery. The dorsal part of the abdomen in the ovarian region was occupied by an irregularly lobulated mass of growth from which projected numerous ordinary pedunculated egg-yolks, and several dark green, necrotic ones. The narrow peduncle of each egg was surrounded by tumor tissue which was tending to spread over the surface, apparently along the perivascular lymphatics. The necrotic eggs had presumably had their vascular supply cut off by this carcinomatous involvement of their pedicles. The right lung was the seat of an advanced broncho-pneumonia, but the tumor had apparently remained localised in the abdomen.

Histologically the tumor was an adenocarcinoma of the short columnar cell type.—I. W. P.

STATE PATHOLOGICAL SOCIETY OF TEXAS

2371. Proceedings, Second Annual Meeting, Galveston, October 12, 1921.

The morning session was spent in an inspection of the laboratories of the John Sealy Hospital and of the medical college. Dr. Mary E. Roe, pathologist, John Sealy Hospital, demonstrated the use of the Benedict metabolism apparatus.

The afternoon session was devoted to a round table discussion of nine topics bearing on the practice of clinical pathology as a specialty in the practice of medicine.

Topic No. 1: How may the practice of clinical medicine and surgery and the practice of clinical pathology be more closely correlated? Opened by Dr. B. F. Stout, San Antonio.

In the absence of Dr. Stout this topic was discussed informally. Summarizing the opinions expressed, there is need for a better understanding between clinicians, surgeons and clinical pathologists regarding their interdependence. Their work, it was shown, could be better correlated by discussing individual cases encountered in daily practice and by comparing clinical findings with those deduced through the application of laboratory methods. It was further shown that contributions by clinical pathologist, presented before medical societies, should include discussion of interpretation in the practical application of a given laboratory method, in the diagnosis of disease, rather than a discussion of its technic.

Topic No. 2: Is the practice of clinical pathology "technical" or "professional," in its relation to the practice of medicine? If "professional," are clinical pathologists "consultants? Opened by Dr. Martha A. Wood, Houston.

Just before the opening discussion the Secretary read a letter from Mr. Will C. Braun, Business Manager Journal American Medical Association, of which the following is an excerpt:

"A number of years ago, when the propriety of accepting advertisements of pathological laboratories was first considered, the ethical question was given serious attention, and it was decided that the service was of a technical rather than professional character."

Dr. Wood: Clinical pathology determines the cause of disease and the functional and anatomical changes produced by disease in the living. The practice of clinical pathology implies the detection of disease causes and the changes in tissue structure and function, by the application of laboratory procedures. The clinician, on the other hand, interprets the signs and symptoms of disease by the unaided senses.

Clinical pathologists are physicians practicing a branch of medicine. They are, therefore, "professional" men. They, by their special knowledge of chemistry, pathology and bacteriology, aid the clinician and surgeon in the diagnosis and prognosis of disease. They are, therefore, "consultants."

With the science of medicine for its foundation, the practice of clinical pathology is not and can not be considered "technical." The amputation of a limb is entirely "technical"—but the restoration of function to a badly mangled and lacerated hand is "professional" surgery.

Topic No. 3: What is the status of the pathologist on the hospital staff and how may the laboratory service aid in the standardization of hospitals? Opened by Dr. Frank Hartman, Temple.

The outstanding points, developed by general discussion of this topic, were:

1. That the laboratory service in all well regulated hospitals is the bulwark of the institution.
2. That the efficiency of the laboratory determines, in a manner, the efficiency of the staff and the reputation of the institution.
3. That modern laboratory methods now constitute a great part of the diagnostic armamentarium of every progressive clinician and surgeon and that few care to hazard their professional reputations without these aids.
4. That, without adequate laboratory facilities, properly directed by a competent pathologist, a hospital can not now fulfill the requirements of the American College of Surgeons for standardization.

Topic No. 4: Should provision be made for the adequate training of laboratory technicians in Texas? Opened by Dr. M. D. Levy, Galveston, and Dr. J. H. Black, Dallas.

Dr. Levy presented a syllabus of a course for technicians in clinical pathology, covering a period of 14 weeks—36 hours each week.

Dr. Black, in his discussion, stressed these points:

1. That there is a definite demand on the part of hospitals and privately conducted laboratories for properly trained technicians.
2. That the present supply of technicians is limited and that institutional and privately conducted laboratories must train their own, resulting in a variable standard of ability.
3. That there is a definite demand on the part of well educated young women for training of this type.
4. That the completion of a short intensive course in some qualified institution, not conducted for gain, would be satisfactory evidence that the individual was capable of being further trained under proper private tutelage. Such a course would relieve laboratory directors of much labor involved in the preliminary training of laboratory technicians.

In the general discussion a warning was expressed that commercially inclined technicians, after such training, might attempt the establishment of laboratories under their direction. It was shown, however, that clinical pathology being a branch of the practice of medicine, the practice of clinical pathology would come within the provisions of the Texas Medical Practice Act which would preclude the direction of a clinical laboratory by one not qualified to practice medicine. Further discussion and final disposition of the topic were reserved for the next meeting.

Topic No. 5: Shall clinicians be invited to become members of this organization? Opened by Dr. W. H. Moursund, Dallas.

The subject of this topic was prompted by a suggestion from Dr. John A. Kolmer.

Dr. Kolmer's letter, of which the following is an excerpt, was read:

"I have examined this (our constitution and by-laws) with great care and have one suggestion to make, namely, that you admit clinicians to membership in your society. You will find that the right sort of clinician is interested in pathology in a broad sense, and their discussions are beneficial to us who are specializing in pathology and bacteriology. Of course, purely clinical papers have no place in a pathological society, but clinical cases, briefly discussed, followed by detailed pathological reports, are in order."

The opinions expressed were favorable to admission of clinicians interested in clinical pathology and at the next semi-annual meeting, the proposition to amend the constitution and by-laws accordingly, will be submitted.

Topic No. 6: Is the publication of fee schedules and other literature, by clinical laboratories, in conformity with the principles of medical ethics? Opened by Dr. Truman Terrill, Fort Worth, Tex.

Topic No. 7: Does the character of clinical laboratory advertisements, carried by the Journal American Medical Association, the Southern Medical Journal, and other medical publications, conform to the Principles of Medical Ethics of the American Medical Association, and is it consistent with ethical standards accepted for clinicians and surgeons? Opened by Dr. E. F. Cooke, Houston.

Owing to the absence of Dr. Terrill, it was voted to discuss these two topics under one head. Communications bearing on these topics were read from Mr. Will C. Braun, Business Manager Journal American Medical Association, Mr. C. P. Loranze, Business Manager, Southern Medical Journal, Dr. Holman Taylor, Editor Texas State Journal of Medicine, and from Dr. Ward Burdick, Secretary Colorado Society of Clinical Pathologists. Following a two-hour debate, the position of the State Pathological Society of Texas, on the question of advertising, stands out clearly in the following main points developed during the discussion:

1. That clinical pathologists are primarily physicians and members of the great national and state medical organizations, the precepts of which are instilled into every physician from the first day of his medical training.

2. That the Principles of Medical Ethics of the American Medical Association, and of the several state associations, do not tolerate self-laudation in any form of advertisement, on the part of surgeons, clinicians or any specialty in medicine.

3. That, as physicians, clinical pathologists are amenable to all the rules and regulations of organized medicine, governing the conduct of other physicians.

4. That the Journal of the American Medical Association, the Southern Medical Journal and some of the state journals are violating the principles of medical ethics when they permit the appearance of self-laudatory laboratory advertisements in their advertising pages.

5. That it is a violation of the principles of medical ethics for laboratories to "circularize" physicians, even under the thin guise of "educational propaganda"; to issue "fee schedules"; to send, unsolicited, containers "with instructions" for the collection of specimens; or to conduct the sale of merchandise under the name of the laboratory.

6. That the advertising by members of the State Pathological Society of Texas be limited to professional cards indicating not more than name, specialty and address.

The following resolution, previously adopted by the Colorado Society of Clinical Pathologists, was adopted without a dissenting vote:

Resolution

"WHEREAS: The diagnosis of disease by laboratory methods, instead of being confined to physicians trained in medicine, is being exploited by lay technicians and commercial houses, and

WHEREAS: There is danger of this specialty in medicine becoming degraded by unseeming and blatant advertisements of commercial laboratories now appearing in certain medical journals.

Therefore be it Resolved: That the status of the clinical pathologist is on a par with that of the internist, surgeon or other specialist in medicine, and conformable to the same code of ethics and high moral standards.

Resolved: That the publication of advertisements calling attention to the merits of a particular laboratory and announcing prices of various laboratory examinations are contrary to good taste and subversive of the ethics of the practice of medicine.

Resolved: That the Journal of the American Medical Association, the Southern Medical Journal, the official journals of the various state medical associations, and other reputable medical periodicals, be requested to bar the advertisements of commercial laboratories from their advertising pages, permitting only licensed graduates of medicine an insertion of their professional cards giving but name, specialty and address.

Resolved: That, in the interests of the patient and for the advancement of scientific medicine, encouragement should be given to the establishment of resident clinical pathologists in all communities where the population and number of physicians warrant specialization in this field of medicine.

Editorials by Dr. Holman Taylor, in the Texas State Journal of Medicine, and by Dr. H. L. D. Kirkham, in the Medical Record and Annals, were read and these editors commended for their very valuable support in placing clinical pathology in the ranks with other medical specialities.

Topic No. 8: Shall the members of this society adopt a "minimum fee schedule" and what shall constitute "minimum fees"? Opened By Dr. M. D. Bell, Dallas.

The members present were unanimous in their opposition to the adoption of any sort of "fee schedule," as such. It was generally agreed, however, that the fees advertised by commercial laboratories were, in many instances, entirely too low and not consistent with the right kind of service nor with fees charged by other specialists for similar service. It was shown that a fee of $5.00 for professional service rendered in making a differential diagnosis in the case of a new growth; the preparation of an autogenous vaccine for a $5.00 fee; or a laboratory diagnosis in a case of syphilis for $5.00, are not commensurate, particularly when the resident clinical pathologist, in common with other practitioners of medicine, must render much gratuitous service to those who are unable to pay. In the matter of consultation, it was agreed that the usual fee charged by other consultants should be accorded the clinical pathologist.

Topic No. 9: Is it properly within the jurisdiction of national state or municipal health agencies to supply gratuitous laboratory service to private individuals—at the expense of the tax payer? Opened by Dr. G. M. Graham, Austin.

Owing to the absence of Dr. Graham, the discussion was opened by reading the following item, clipped from page 224, Texas State Journal of Medicine, issue of August, 1921:

"The laboratories of the State Board of Health have been established for the purpose of giving aid to the people of this State, through physicians, by making investigations and reporting findings, which may be of assistance in diagnosing diseases. There is no charge for this service. Physicians and surgeons in need of laboratory service are earnestly urged to make use of the facilities offered by the laboratories of the State Board of Health."—*Manton M. Carrick, State Health Officer.*

Attention was directed to the danger of state medicine involving, in time, other specialties and, eventually, the entire practice of medicine—including surgery. That there was a well defined place where public health laboratories should function was unquestioned. But the tendency to undertake the diagnosis of disease, in no sense communicable and which in no way involved the consideration of public health, was regarded as a misapplication of purpose and a concurrence of expense which has not been reckoned by the tax payer. The Society recorded its disapproval of the notice read and instructed its Secretary to communicate with Dr. Carrick defining its position regarding the rendition of gratuitous laboratory service to private individuals, unless such service was rendered in the protection of the public health.

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APR 25 1922

THIS ISSUE COMPLETES VOLUME V
The Indexes for Volume V will appear in March, 1922, issue

VOLUME V NUMBER 12

ABSTRACTS
OF
BACTERIOLOGY

UNDER THE EDITORIAL DIRECTION OF THE
SOCIETY OF AMERICAN BACTERIOLOGISTS

DECEMBER, 1921

EDITOR
A. PARKER HITCHENS

It is characteristic of Science and Progress that they continually open new fields to our vision.—PASTEUR

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ABSTRACTS OF BACTERIOLOGICAL LITERATURE

CHARACTERIZATION AND CLASSIFICATION

(*See also Number 2514*)

2372. The Antigenic Properties of B. psittacosis. H. Marrian Perry. Brit. J. Exper. Path., Lond., 1920, **1**, 131–134.

The culture was obtained from a South African bird which died a few weeks after its arrival in this country. It was identified with a strain to which was attributed the cause of a fatal form of infectious disease which appeared amongst a consignment of parrots imported to Paris. Forty-two human contact cases of illness were attributed to infection with the organism fatal to the parrots, which was found to be identical with that member of the Salmonella group of organisms designated *B. aertrycke* (*suipestifer*).

Perry found that the agglutinin absorption properties of his organism were identical with those of a strain of *B. aertrycke* of the "mutton" type.—A. C. E.

2373. Pyocyanoïdes et réaction de l'anti-protéase. (*Pyocyanoides Strains and the Anti-protease Reaction.*) A. Falque. Compt. rend. Soc. de biol., Par., 1921, **85**, 799–800.

The antiprotease reaction was applied to the differentiation of proteolytic bacteria. Strains, which might be *B. pyocyaneus* organisms that had lost their chromogenic property, were subjected to the action of specific *B. pyocyaneus* antiprotease. The reaction differentiated the pyocyanoides strains from other apparently unrelated fluorescent organisms. —G. H. S.

2374. Modifications biologiques du B. coli en milieux phéniques. (*Biological Modifications in B. coli in Phenol Media.*) Paul Fabry. Compt. rend. Soc. de biol., Par., 1921, **85**, 884–886.

After repeated transfer in a phenol medium *B. coli* loses its power of producing indol. This property is not regained if the organisms are returned to a normal medium, or if they are passed through the peritoneum of a guinea pig.—G. H. S.

2375. Étude de l'agglutination du B. coli "modifiée" par le phénol. (*Agglutination of B. coli Modified by Phenol.*) Paul Fabry. Compt. rend. Soc. de biol., Par., 1921, **85**, 886–888.

Rabbits were immunized with normal *B. coli*, and with a strain which had lost its indol producing property as the result of growth in a phenol-containing medium. With these sera and strains cross agglutination reactions were performed. The normal strain was never agglutinated by the serum produced to the "modified" strain; but the "normal" serum agglutinated both the normal and atypical strains.—G. H. S.

2376. Morphologische Studien an Bakterien. (*Morphologic Studies of Bacteria.*) Philalethes Kuhn. Berl. klin. Wchnschr., 1921, **58**, 296–299.

Vibrio metschnikovi and the mouse typhoid bacillus were studied after being grown on agar, fixed by the v. Wasielewski and Kühn method, and stained with Giemsa. The morphology was thus observed at different stages of growth. Four different forms are described. The usual rod form was, of course, most in evidence. As these grew older, there appeared massed groups in string form possessing "branches" (dendritic form), or bulb-like shapes (ameboid form) with vacuoles and granules. A coccus shape was also found which was unique in that it could be cultivated separately from the rods. The rods always gave rise to coccoid forms as well, but the coccoids never could be made to produce rods. It is believed that these forms are to be found in all bacterial species.—B. C.

BACTERIAL NUTRITION AND METABOLISM

(*See also Numbers 2490, 2536*)

2377. A New Medium for the Growth of B. influenzae. Paul Fildes. Brit. J. Exper. Path., Lond., 1920, **1**, 129–130.

Ox or sheep blood was digested with pepsin. Chloroform was then added. The author kept this material at room temperature for over 12 months without deterioriation. For use 2 to 5 per cent was added to broth or melted agar.—A. C. E.

2378. A Toxic Substance Obtained by Growing Hemolytic Streptococci in a Special Medium. L. C. Havens and M. L. Taylor. Am. J. Hyg., 1921, **1**, 311.

The authors have devised a special medium consisting of distilled water, 1 per cent peptone, 1 per cent di-sodium phosphate and 0.5 to 1 per cent glucose. The reaction is adjusted to pH 8.0 to 8.2. In this medium hemolytic streptococci are found to produce a toxic substance of fairly high potency which can be passed through a filter. The toxicity is not due to acidity and is specific. It is destroyed by heating to 62°C. for 30 minutes and rapidly loses strength on standing. The substance possesses definite antigenic properties and the sera of rabbits immunized with such toxic filtrates protect both against infection with hemolytic streptococci and intoxication with filtrates of the special medium.—P. D. M.

2379. Influence des sucres sur la production d'indol. (*The Effect of Sugars upon Indol Production.*) R. Appelmans. Compt. rend. Soc. de biol., Par., 1921, **85**, 725–726.

The ability of various organisms to ferment sugars (glucose, maltose, mannite, saccharose, lactose) with gas production was correlated with the inhibitory influence these sugars have upon indol production. With all but one strain of *B. coli* tested a complete agreement existed between gas production and inhibition of indol production. A single strain gave abundant indol in the presence of saccharose although this sugar was fermented. With various strains of *Proteus vulgaris* a constant relationship between fermentation and inhibition of indol obtained. Mannite and lactose were not fermented nor did they interfere with indol production, while the presence of fermentable sugars prevented the development of indol. Indol may be found in old cultures after the sugar has been exhausted. *B. dysenteriae* produced indol in the presence of the sugars except glucose. *V. cholerae* gave indol in the presence of all sugars. *Vibrion septique* failed to yield indol in the sugar media.—G. H. S.

2380. Influence des sucres sur la production de l'indol, à propos d'une note de R. Applemans. (*Effect of Sugar on Indol Production.*) Ranque and Senez. Compt. rend. Soc. de biol., Par., 1921, **85**, 937–938.

The findings of Applemans confirm earlier reported work of the authors.—G. H. S.

2381. Antagomisme biologique entre le Bacille de Löffler et le Pneumobacille de Friedländer. (*Biologic Antagonism between the Bacillus of Friedländer and Bact. diphtheriae.*) J. Gaté and G. Papacostas. Compt. rend. Soc. de biol., Par., 1921, **85**, 859–861.

As in cases of angina the Bacillus of Friedländer overgrows *Bact. diphtheriae*, so also upon artificial media a definite antagonism is presented.—G. H. S.

2382. Sur la structure et le mode de développement des Bactéries. (*The Structure and Mode of Development of Bacteria.*) Aug. Kirchensteins. Compt. rend. Soc. de biol., Par., 1921, **85**, 787–790.

Special staining methods are given for demonstrating the structure of such bacterial cells as *B. mycoides* and *B. anthracis*. From studies of such cells the author concludes that the granular particles seen in the protoplasm represent an essential part of the bacterial cell of nuclear nature. This material, present in the vegetative cell, condenses with spore-formation, and reappears with germination. The structure of the bacterial cell is analogous to that of the cells of higher organisms. Multiplication among bacteria may be amitotic or by processes of mitosis, essentially those of higher forms.—G. H. S.

THE TWORT-D'HERELLE PHENOMENON—BACTERIOPHAGE

2383. Identité du phénomène de Twort et du phénomène d'Herelle. André Gratia and D. Jaumain. Compt. rend. Soc. de biol., Par., 1921, **85**, 880–881.

The phenomena are considered to be identical. Experiments on the lysis of staphylococci are reported.—G. H. S.

2384. Das bakteriophage Virus von d'Herelle. (*The d'Herelle Bacteriophage Virus.*) Oskar Bail. Wien. klin. Wchnschr., 1921, **34**, 237–238.

In a living and multiplying culture of bacteria there are formed specific catabolic "fragments," some small enough to penetrate a Berkefeld filter. These fragments require for their multiplication a living substratum of the bacteria which have, so to speak, dismembered them. The multiplication of d'Herelle's bacteriophage is thus explained. The relations of the Weil-Felix proteus bacillus to typhus fever, of *B. suipestifer* to hog cholera, and of streptococci to scarlet fever assume a new aspect in the light of the d'Herelle phenomenon.—B. C.

2385. L'ultramicrobe bactériophage. (*The Ultramicroscopic Bactériophage.*) F. d'Herelle. Compt. rend. Soc. de biol., Par., 1921, **85**, 767–768.

A discussion of the several theories of the nature of the bacteriophagous principle is given. The author holds that the experimental data available lends itself best to his interpretation; namely, that the virus is viable and maintains itself as a parasite of the bacterial cell.—G. H. S.

2386. Unicité du bactériophage; sur la lysine du bactériophage. (*Unity of the Bacteriophage. The Bacteriophagous Lysin.*) F. d'Herelle and G. Eliava. Compt. rend. Soc. de biol., Par., 1921, **85**, 701–702.

The observation that an antiserum produced by a Shiga bacteriophage will fix complement, not only in the presence of the Shiga bacteriophage but with plague and other bacteriophagous material as well, confirms the view that there is but a single bacteriophage. This virus is capable to becoming adapted to organisms of different species. Additional evidence is presented showing that the bacteriophage acts through diastases, the lysins.—G. H. S.

2387. *Dualité du principe lytique du Colibacille et du Staphylocoque.* (*Duality of the Lytic Agent Directed against B. coli and the Staphylococcus.*) André Gratia and D. Jaumain. Compt. rend. Soc. de biol., Par., 1921, **85**, 882–884.

The principles lytic for *B. coli* and for staphylococci were subjected to heating for 30 minutes at temperatures between 56 and 60°C. At 61 to 62°C. the activity of the agent for staphylococci is lost while that for *B. coli* is not destroyed until the temperature reaches 65°C. Variations in heat resistance are to be observed so that such experiments hardly suffice for the differentiation of the lytic agents. Experiments upon the action of antisera in relation to the lytic agents appear to show that the bacteriophagous principles differ fundamentally. From such experiments the authors conclude that there is a multiplicity of such lytic substances.—G. H. S.

2388. *Le phénomène de d'Herelle et la réaction de fixation.* (*The d'Herelle Phenomenon and Complement Fixation.*) E. Wollman and L. Goldenberg. Compt. rend. Soc. de biol., Par., 1921, **85**, 772–774.

Rabbits were immunized with *B. dysenteriae* Shiga and with a Shiga-bacteriophage bacteriolysate. Cross complement fixations were performed, and the sera after adsorption with *B. dysenteriae* Shiga were used for fixation tests with both antigens. The results indicate that the autolysate possesses antigenic value quite apart from its *B. dysenteriae* antigen.—G. H. S.

2389. *Au sujet de l'action inhibitive du principe bactériophage sur le développement des microbes réceptifs.* (*The Inhibitory Action of the Bacteriophagous Principle upon the Development of Susceptible Organisms.*) J. de Necker. Compt. rend. Soc. de biol., Par., 1921, **85**, 742–744.

By means of complement fixation and precipitin reactions with an antibacteriophagous serum and filtrates from cultures of the bacteriophage with a susceptible organism it appears that the inhibitory action exerted by the bacteriophage is a real and not merely an apparent characteristic of the virus.—G. H. S.

2390. *Le bactériophage dans l'organisme.* (*The Bacteriophage in the Body.*) R. Applemans. Compt. rend. Soc. de biol., Par., 1921, **85**, 722–724.

Experiments were conducted upon guinea pigs and mice to determine the degree of dissemination of the bacteriophage throughout the body after artificial inoculation. When introduced by way of the digestive tract the bacteriophage was found to persist in the intestinal contents for some days. No evidence could be secured to indicate that the virus passed through the walls of the intestine and so into the organs. When the virus was injected it was found to be rapidly taken up by the blood and eliminated by way of the kidneys and the intestinal tract. It appeared to persist for some time in the spleen.—G. H. S.

PHYSICAL CHEMISTRY

2391. *Essais expérimentaux au sujet de l'influence exercée par le bain de lumière universel sur l'action de la toxine diphtérique dans l'organisme.* (*The Effect of Irradiation upon the Action of Diphtheria Toxin in the Body.*) Carl Sonne. Compt. rend. Soc. de biol., Par., 1921, **85**, 759–761.

Guinea pigs injected with a lethal dose of diphtheria toxin were subjected to irradiation. The results indicated that the light caused a destruction of 40 per cent of the toxin injected.—G. H. S.

BACTERIOLOGICAL TECHNIC

2392. *The Determination of the Reaction of Bacteriological Culture Media.* James McIntosh and William A. M. Smart. Brit. J. Exper. Path., Lond., 1920, 1, 9–30.

This paper is of interest to those confronted with the problem of preparing culture media when standard buffer mixtures are not available. The authors recommend the use of thymolphthalein as an indicator. The medium is titrated in the cold, adding the alkali until the first perceptible darkening is observed. This occurs at a reaction of about pH 9.0. They consider it advantageous to bring the meat extract to an alkaline reaction in order to get rid of the excess of phosphates. The final reaction is adjusted to pH 7.6 by the addition of $\frac{n}{1}$ HCl according to Eyre's system. The authors found that the addition of 1cc. of $\frac{n}{1}$ acid per liter makes a change of 0.1 pH in the reaction of culture medium of standard composition. Three steamings for half an hour were found to cause less hydrolysis than one autoclaving at 115°C.

The paper includes a simplified explanation of the theory of electrolytic dissociation as applied to culture media.—A. C. E.

2393. Gonokokkenzüchtung. (*Gonococcus Cultivation.*) W. Klein. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 286.

Poured plates are more desirable than streaks for the isolation of the gonococcus. Sterile filtered ascitic fluid is added to an equal volume of melted 2 per cent agar, and the mixture is used for pouring after being inoculated with the material under examination. The conditions for growth are more satisfactory and the practiced person can readily recognize the typical colonies.—B. C.

2394. A Litmus Solution Suitable for Bacteriological Purposes. James McIntosh. Brit. J. Exper. Path., Lond., 1920, **1**, 70.

A description is given of a method for preparing litmus solution which has given every satisfaction after an extensive and prolonged trial.—A. C. E.

2395. A Simple Method of Recording Automatically the Gas Produced by Bacteria in Culture and of the Oxygen Absorbed by Aerobic Non-Gas-Forming Bacteria. Alexander Fleming and Francis J. Clemenger. Brit. J. Exper. Path., Lond., 1920, **1**, 66–69.

A description of the apparatus is accompanied by illustrations.—A. C. E.

2396. Technique for the Demonstration of the Capsules of Bacteria. S. L. Baker. Brit. J. Exper. Path., Lond., 1920, **1**, 127–128.

According to this method the background is colored with India ink, and the bacteria are stained with gentian violet and Gram's iodine. The capsule appears as a white line surrounding the bacteria. A plate shows capsules surrounding *Streptococcus mucosus*, pneumococcus, and meningococcus,—A. C. E.

2397. Ueber die Beobachtung von Bakteriengeisseln im Dunkelfeld. (*Observation of Bacterial Flagella in the Dark Field.*) M. Ficker. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 286.

Remarkably clear pictures are obtained of flagella in stained slides (even faded ones) by use of dark field illumination. The equipment consists essentially of a Leitz dark field condenser, a Zeiss $\frac{1}{12}$ immersion lens with reducing diaphragm, a No. 6 compound ocular and a small arc light.

The flagella are visible in ordinarily stained specimens which have not been mordanted, but the results are not uniform. The mordants alone are more satisfactory for this purpose. With suitable manipulation it is possible to differentiate *Bact. coli* from *Bact. typhosum* by observation of the flagella in the dark field. Directions for preparation are as follows: Prepare and fix the material for flagella staining as usual. Mordant for 3 to 5 minutes with filtered Peppler's mordant. Carefully rinse and allow to air-dry. Lay the dried specimen upon a small drop of highly diluted crystal violet, and observe at once.—B. C.

2398. A Brief Study of the Range of Error in Micro-Enumeration. W. E. Allen. Tr. Am. Micr. Soc., Menasha, 1921, **40**, 14–25.

A study directed toward the determination of error in the usual methods of counting microscopic organisms. The author finds that the extreme deviation in counts can be kept within 25 per cent; the mean deviation within 10 per cent; and that the causes of variability are to be found in the processes of mixing, sampling, and spreading on the slide, rather than in the counting.—J. H. B.

2399. Beitrag zum färberischen Nachweis der Tuberkelbazillen nach der Konrich'schen Methode. (*Detection of B. tuberculosis by the Staining Method of Konrich.*) V. de Mestral. Schweiz. med. Wchnschr., 1921, No. 38, 873–874.

The method is considered very satisfactory, being particularly well adapted to staining *B. tuberculosis* in histological sections.—G. H. S.

2400. Microscope Illumination With Reference to Brownian Movement and Combination Lighting. Alexander Silverman. Tr. Am. Micr. Soc., Menasha, 1921, **40**, 158–160.

A brief note calling attention to the advantage of the Silverman illuminator in the study of Brownian movement and of combined lighting in the study of objects such as insects.—J. H. B.

2401. Ein Seroskop. (*Disperskop*). (*A Seroscope or Disperscope.*) H. Dold. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 413–414.

A microscope attachment is described which permits magnifications of 10 to 500, and is intended to supplement the dark-field microscope. It is generally useful for observation of the structure of coarse colloidal materials, for reading results of flocculation and agglutination reactions, for study of the "dry drop," and for observation of bacterial colonies in test tube cultures.—B. C.

2402.—A Method For Orienting and Mounting Microscopical Objects in Glycerine. Charles Bullard. Tr. Am. Micr. Soc., Menasha, 1921, **40**. 89–93.

A detailed description of the technic involved.—J. H. B.

HISTOLOGICAL TECHNIC

2403. Weitere Erfahrungen über Spirochätenfärbungen im Nervengewebe. (Spirochetal Staining in Nervous Tissue.) F. JAHNEL. München. med. Wchnschr., 1920, **67**, 1263.

The success of the Noguchi and Levaditi methods for staining spirochetes in brain tissue seems to depend upon some undiscovered quality of the formalin used for fixation. —B. C.

2404. A Method of Demonstrating the Sheath Structure of a Desmid. WM. RANDOLPH TAYLOR. Tr. Am. Micr. Soc., Menasha, 1921, **40**, 94–95.

Fresh living material is placed in 0.05 per cent aqueous solution of methylene blue for 45 to 60 seconds. Rinse in distilled water and place in 1-10 saturated aqueous solution of picric acid. This serves to fix the stain and bring out the striations in the sheath. The material may be examined in the picric acid solution or removed to water.—J. H. B.

MYCOLOGY

(See also Number 2452)

2405. L'action mécanique des lichens dans la détérioration des vitraux d'église. (The Mechanical Action of Lichens in the Deterioration of Church Windows.) ETHEL MELLOR. Compt. rend. Soc. de biol., Par., 1921, **85**, 634–635.

In the deterioration of glass due to the growth of lichens mechanical as well as chemical processes are operative. The forms of greatest significance are *Xanthoria parietina, Placodium murorum, Lecanora erysibe* and *Pertusaria leucosora.*—G. H. S.

SOIL BACTERIOLOGY

(See also Number 2411)

2406. Inoculated Legumes as Nitrogenous Fertilizers. P. E. BROWN AND J. H. STALLINGS. Soil Sc., Balt., 1921, **12**, 365–408.

This investigation is directed towards the securing of preliminary information of the actual amount of nitrogen which legumes obtain from the atmosphere and soil under a wide range of soil conditions, particularly as regards nitrogen content. The results have been obtained by the inoculation of red clover and alfalfa on Carrington loam and Miami fine sandy loam, two extensive soil types in Iowa; and the distribution of nitrogen between the tops and roots of these legumes at various stages of growth, under control conditions has also been indicated. Pots holding 10 pounds of soil were employed in the usual manner.

The results are summarized as follows.

"1. On the average, 36 per cent of the total plant growth of clover was in the roots at maturity on the unsterilized soil. On the sterilized soil the percentage was lower.

"2. A larger proportion of the total plant growth of clover was in the roots at maturity on the soil poorer in organic matter and nitrogen. On the better soil there was greater total growth and a much greater growth of tops.

"3. Over half the plant growth (53 per cent) of the alfalfa was in the roots at maturity on the unsterilized Carrington loam—slightly less (48 per cent) on the unsterilized Miami fine sandy loam. On the sterilized inoculated Carrington loam the percentage was lower.

"4. The per cent of total nitrogen in the roots of clover and alfalfa was greater on the soil poorer in organic matter and nitrogen.

"5. On the average, 27 per cent of the total plant nitrogen was in the roots of clover at maturity under natural soil conditions while with alfalfa an average of 46 per cent of the total plant nitrogen was in the roots.

"6. With clover there was a greater fixation of nitrogen on the poorer soil, while with alfalfa the greatest fixation was on the better soil.

"7. From 12–25 cgm. of nitrogen was fixed per plant by clover and alfalfa on untreated soils.

"8. With clover on both soils unsterilized all the nitrogen in the tops and some of that in the roots came from the air. On the Miami soil a larger proportion of the nitrogen in the roots came from the air than on the Carrington.

"9. With alfalfa all the nitrogen in the tops and some in the roots came from the air.

"10. When clover and alfalfa are grown and the hay crops removed, there may be some gain in nitrogen in the soil, the amount of the increase of the elements in the soil varying with the legume, the soil type, the inoculation, and the general growth conditions."

The authors point out that it is impossible to draw any very definite or broadly applicable conclusions from the foregoing experiments, but that they indicate how great may be the fixation of nitrogen from the atmosphere by individual leguminous plants. The necessity for further experimentation along these lines is indicated.—N. K.

2407. Preliminary Note on the Microbiology of the Soil and the Possible Existence Therein of Invisible Germs. G. ROSSI. Soil Sc., Balt., 1921, **12**, 409–412.

The author draws attention to discrepancies in methods which lead to: (a) the uncertainties in computation of the microbes in the soil; (b) the different processes from the detrimental influence that the number and variety of microorganisms capable during development of exerting spontaneously upon each other; (c) the influence of methods employed for the isolation of microbial species in the soil; (d) inadequacies of methods as applied to isolation of given species; (e) enormous differences in the sterilization of soils; (f) lack of sensitivity of certain chemical methods.

The inadequacy of the recognizable microbial flora in the soil to explain many biochemical phenomona has led the author to seek for the possible presence of invisible or ultramicroscopic flora. His methods are as follows: Soil and water are mixed in equal parts, decanted, and filtered through porous candles into desired liquids for testing the various biochemical reactions. With Gusseerie Park soil, it was found that (1) this infusion does not contain indol but does contain ammonia and nitrates; (2) the nutritive media alone did not produce indol except when not filtered; (3) the infusion did not cause any increase in nitrites beyond those present in the usual cultural media.

The conclusion arrived at, therefore, is that there does not exist sufficient evidence to disprove the presence of invisible germs. Further experiments along these lines are in progress.—N. K.

2408. *Bacteriological Studies of Methods of Preparing a Seedbed for Wheat.* P. L. Gainey. Kansas Agric. Exp. Sta., Tech. Bull. 8, 1920, 64 p.

Different methods of preparing the seedbed for winter wheat cause great variations in the accumulation of nitrates. This study attacks the bacteriological reasons for such variations. Soils from plots receiving different treatments when studied in the laboratory by the usual methods showed little or no variation in their powers to accumulate nitrates, nor did they show any significant variation in their powers to initiate nitrate production when used as inocula in various sterile substrata. In all plots it appeared that nitrification took place as rapidly as ammonia became available.

The difference between the accumulation of nitrates in the different plots appeared to be due to a difference in the consumption of nitrates rather than a difference in production. Denitrification and nitrate assimilation by microorganisms did not appear to account for the differences occurring in the plots receiving different treatments. It was noted that there was great variations in weed growth on the plots under different treatments, which factor appeared to be the major one affecting nitrate accumulation. "A study of the possible factors causing the disappearance of nitrates revealed the significant fact that practically all observed differences in nitrate content between early and late plowed plots could be accounted for by the amount of nitrogen assimilated by the weeds growing thereon."—J. M. S.

2409. *Effect of Soil Temperature upon the Development of Nodules on the Roots of Certain Legumes.* F. R. Jones and W. B. Tisdale. J. Agric. Research, Wash., 1921, **22**, 17-31.

During a search for the cause of a diseased condition of alfalfa under observation in 1917 and 1918, the writers were led to believe it likely that soil temperature, within the range which occurs in cultivated fields, affects the initiation and the development of nodules on the roots of alfalfa and perhaps all other legumes to such a degree that the assimilation of nitrogen by these plants is greatly modified by this factor during the summer.

Four legumes were used in the experimental work: Alfalfa, red clover, soybeans and field peas. The pots in which they were grown were kept in water baths so as to control the temperature of the soil. Various temperatures between 12° and 36°C. were used. The tops of the plants were all submitted to the same atmospheric temperature.

At first most attention was paid to the number of nodules, but as it was found that some plants produced at the higher temperatures an especially large number of very small nodules, it was considered more satisfactory to determine the weight of the nodules. Although there were no consistent differences in the number of nodules, their weight varied regularly, being smallest at each extreme of temperature. With soybeans (the plant studied the most thoroughly) the maximum production of nodules by weight was found at 24°C.

The different legumes were found to have different powers of resisting the higher temperatures, and there was no definite correlation between weights of nodules and weights of tops or weights of roots.—H. J. C.

PLANT PATHOLOGY

(See also Number 2606)

2410. *Die Krankheiten unserer Waldbäume und wichtigsten Gartengeholze. (The Diseases of our Forest Trees and most Important Garden Shrubs.)* F. W. Neger. viii + 286 p., 284 fig. Ferdinand Enke: Stuttgart, 1919.

After a short introduction the author presents his material in 2 main divisions. The 1st part treats diseases resulting from frost, heat, lack of or too much light, disturbance of the water balance, lack of or too much nutrient, poisonous gases, smoke, atmospheric disturbances such as wind, snow, lightning, etc., and mechanical injuries. The 2nd part opens with a general discussion of immunity, susceptibility, infection, host reaction, and control of parasitic diseases, and then takes up bacterial diseases, fungous diseases, and the injuries caused by lichens and parasitic phanerogams. The data on any particular disease are presented from the symptomatic standpoint, but short keys on the mycological differences of the parasitic species within a given genus are inserted whenever necessary. Footnote references to pertinent literature, in many cases accompanied by abstracts of the results obtained by the investigators cited, are used frequently. At the end of the book concise symptomatic description of the diseases discussed in the text are given under the name of the host.—R. H. C. (*Contrib. by Bot. Abstr.*)

DAIRY BACTERIOLOGY

(*See also Number 2480*)

2411. Ergebnisse Amerikanischer, Britischer und Französischer Arbeiten auf dem Gebiete der landwirtschaftlichen Bakteriologie aus den Jahren 1915–1920. (*A Report of American, British and French Investigations in the field of Agricultural Bacteriology during the Years 1915–1920.*) F. Löhnis. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1921, **54,** 273–307.

This is a report of investigations in agricultural bacteriology carried on in the three major allied countries during the recent European war and the period following. Publications having only a practical bearing and those in which earlier investigations were repeated are not included. Altogether 363 references are given, a number of which cover more than one paper. The review is divided into the following major sections: microorganisms in foodstuffs, in milk and milk products, in stable manures and in soil.

It is interesting to compare, on the basis of this review, the amount of scientific work carried out in agricultural microbiology, during the period of 1915–1920, in the United States, in comparison with Great Britain (including all the Dominions) and France.

In this comparison, the total number of papers is taken and not the number of references only.

I. Microbiology of foodstuffs

	number	*per cent*
United States	21	87.5
Great Britain	3	12.5
France	0	0
Total number of papers	24	

II. Microbiology of milk and milk products

	number	*per cent*
United States	103	89.6
Great Britain	6	5.2
France	6	5.2
Total number of papers	115	

III. Microbiology of stable manures

	number	*per cent*
United States	7	78.0
Great Britain	2	22.0
France	0	0
Total number of papers	9	

IV. Microbiology of soils

	number	*per cent*
United States	206	77.0
Great Britain	53	19.7
France	9	3.3
(Japan)	1	
Total number of papers	269	

It is quite clear from this brief résumé that the United States is leading by far both Great Britain and France in the number of scientific contributions in all branches of agricultural bacteriology.

It is interesting to note that the leading publications, in the United States, covering the field of agricultural bacteriology, for the period mentioned, are Experiment Station Bulletins, coming first, Soil Science, a close second, and The Journal of Agricultural Research following. As far as the papers in Soil Microbiology are concerned, Soil Science takes the leading place. —S. A. W.

2412. In How Far is the Bacterial Count of Milk Influenced by the Dirt Content? H. A. Harding, M. J. Prucha, E. F. Kohman, H. M. Weeter and W. H. Chambers. J. Dairy Sc., Balt., 1921, **4,** 430–447; Creamery & Milk Plant Month., Chicago, 1921, **10,** No. 11, 31–35.

This paper is a report of the effect of visible dirt and sediment in increasing the bacterial count of fresh milk carried out at the Illinois Agricultural Experiment Station. A review of work previously reported (see Abs. Bact., 1, No. 1533) is given. In this earlier work it was shown that the germ content of fresh milk drawn into sterile utensils averaged about 1,000 per cc. at Barn 1, about 1000 per cc., at Barn II, 5775 per cc. at Barn III. At the first two of the barns conditions were clean while at the third barn the cattle were stabled on a dirt floor over which straw and manure were allowed to accumulate.

In continuing this work the cows were allowed to become very dirty with dried manure covering the flanks. The average germ content of milk drawn into sterilized small top pails under these conditions increased to 14,000 per cc., while the milk contained an average of 8.1 mgm. of dirt per quart. When ordinary milk pails were used the average germ content of the milk was again increased to 18,244 per cc., while the dirt was increased to an average of 10.8 mgm. per quart. The cows were then cleaned and all other conditions allowed to remain the same. The average germ content of the milk under these conditions dropped to 7117 per cc., while the dirt content dropped to 4.6 mgm. per quart.

Computations based on these results indicated that the dirt in this milk contained between 1,313,980,000 and 1,507,840,000 germs per gram while direct observations made of the germ content of similar material indicated that these computations represented actual conditions fairly well.

The conclusion drawn is that dirt does not contribute largely to the initial germ content of milk. It is clear from the paper, however, that the authors have in mind only visible sediment and do not consider material derived from unclean utensils as dirt.—R. S. B.

2413. The Agar Plate Method in Milk Bacteriology. HAROLD MACY. Am. Food J., N. Y., 1921, **16**, No. 10, 23–24.

A condensed statement of the technical phases of the plate count examination of milk-media and their hydrogen-ion determination, sterilization, collection of samples, plating and colony counting as prescribed by the Standard Methods for the Bacteriological Examination of Milk (1921).—J. B.

2414. Ueber den Einfluss verschiedener Kohlehydrate auf die Gerinnungsvorgänge der Milch. (Influence of Different Carbohydrates on the Clotting of Milk.) ERICH ASCHENHEIM. Berl. klin. Wchnschr., 1920, **57**, 156–157.

The clotting of cow's milk in the presence of polysaccharides results in a fine, loose clot which approaches human milk clot in physical qualities.—B. C.

2415. Microscopic Study of Bacteria in Cheese. G. J. HUCKER. J. Agric. Research, Wash., 1921, **22**, 93–101.

A detailed account of a method is outlined by which cheese can be embedded in paraffin and sectioned, similar to pathological preparations, and stained with a weak aqueous solution of methylene blue. Formulae are given by which the estimation of the numbers of bacteria present can be determined.

A discussion is added dealing with the comparison of the distribution of bacteria in cheese when samples are studied culturally and microscopically.—G. J. H.

2416. Bacteriological and Chemical Studies of Different Kinds of Silage. C. A. HUNTER. J. Agric. Research, Wash., 1921, **21**, 767–789.

The author studied the nature of the fermentations taking place in silage, composed of a mixture of silage crops, by a series of samples taken from two silos which contained, in different seasons, Canada field peas and oats, corn, and corn and soybean mixture.

From the bacteriological and chemical analysis little difference could be noted between the fermentation taking place in silage composed of Canada field peas and oats, corn and soybeans, and corn only. There was a larger number of organisms belonging to the bulgaricus type in corn silage than in the other types of silage studied.

Microörganisms were responsible for the production of acid and the formation of ammonia, while plant enzymes also produced ammonia and hydrolyzed the protein with the formation of amino nitrogen.

Yeasts apparently had little effect upon the fermentation of silage except during the first few days.—G. J. H.

COMPARATIVE PATHOLOGY

(See also Numbers 2450, 2527)

2417. Acute Exudative Meningo-encephalitis in Domestic Animals. S. A. GOLDBERG. Cornell Vet., Ithaca, 1921, 11, 64–72.

The author believes that this disease occurs more frequently than is generally supposed. It seems to occur in young animals more often than in the older ones. The post mortem and bacteriological findings in 10 cases occurring in calves, lambs, puppies and a pony are noted. Streptococci and a diplococcus found in smears were isolated in nearly every instance.—H. C. H. K.

2418. The Blood, Urine and Tissue Juices in Azoturia:—A Preliminary Report. C. E. HAYDEN AND MARCOS TUBANGUI. Cornell Vet., Ithaca, 1921, **11**, 81–84.

The findings to date show that the extractives in the blood of azoturia cases are not different from those of the normal animal, but that non-protein nitrogen and preformed creatinin are increased in the tissue juices. The kidney in this disease has always been thought to be the seat of a functional change but examinations of urine did not indicate a nephritis.—H. C. H. K.

2419. Note sur le diagnostic de la Morve. (*Note on the Diagnosis of Glanders.*) R. VAN SACEGHEM. Ann. de méd. vét., Brux., 1921, **66**, 97.

A review of well-known methods used in the diagnosis of glanders. The imperfections, and advantages of each are considered briefly. In addition, an original observation is reported which the author employs as an aid in diagnosing *obscure* cases, where the mallein reaction is uncertain. In all cases of glanders, acute or chronic, external or internal, there is a constant very well marked neutrophilic polymorphonuclear leucocytosis. This is constant regardless of the temperature of the animal. If no other infection is apparent, this blood reaction together with the mallein reaction, is an aid in establishing the diagnosis.—D. C. B.

2420. La vaccination antigourmense. (*Vaccination against Strangles.*) R. VAN SACEGHEM. Ann. de méd. vét., Brux., 1921, **66**, 100.

LeClainche and Joly have demonstrated that the exudate of cutaneous strangles eruptions will produce a benign eruption when inoculated into a susceptible horse by scarification of the skin. This benign form of the disease is capable of immunizing the horse against subsequent attacks of the disease. Various investigators in their studies of strangles, conclude the streptococcus of strangles (streptococcus of Schütz) to be the etiologic agent. Serological and bacterial products prepared with this organism have been used more or less successfully in protecting against the disease.

Saceghem describes a new method used with encouraging success in the Belgian Army. The bacterin is prepared from a 48–hour growth of the streptococcus of strangles, in bouillon, killed at 56°C. Vaccination for immunization consists in the subcutaneous inoculation of this bacterin in 3 doses, at intervals of 8 days. The first dose is 5 cc., the other two are 10 cc., each. Vaccination by employing doses of 10 cc., given repeatedly, possesses decided curative features.—D. C. B.

2421. Treatment for Removing the Gastro-Intestinal Parasites of Horses. MAURICE HALL. North Am. Vet., Chicago, 1921, **2**, 512–24–50.

The common parasites found in the gastro-intestinal tract of the horse, include the following forms: Bots, stomach worms, ascarids, strongyles, and pin worms. The author is of the opinion that with the exception of Habronema, we now have effective drugs, and well established treatments for the removal of these parasites. The established treatments are described in detail. From experiments with carbon tetra-chlorid the writer concludes that this drug is ineffective against Habronema.—W. L. B.

2422. Internal Administration of Arsenic on Canker and other Diseases of the Foot in Horses. J. D. E. HOLMES. Vet. Med., Chicago, 1921, **16**, 21–22.

The author while experimenting with arsenious oxid in the curative treatment of surra in horses, observed the effects of arsenic in certain other pathological conditions, especially canker of the foot. Case reports of canker of the foot in which arsenic was used as the remedial agent are described. The effect of arsenic on other pathologic conditions of the foot, such as thrush, sandcrack and brittle hoof is mentioned. It is stated also that arsenic was equally effective in the treatment of cases of melano-sarcomata.—W. L. B.

2423. Sa piroplasmosi in Dalmatia. (*Piroplasmosis in Dalmatia.*) UGO INCHIOSTRI. Clin. vet., Milano, 1921, **44**, 409–421; 447–454.

This is a discussion of the various forms of piroplasmosis observed in Dalmatia among sheep, goats, horses, cattle and dogs; and the methods of prophylaxis and cure being employed. —F. W. T.

2424. Sa peste equina in Eritrea. (*Horse Sickness in Eritrea.*) BATTISTA TARANTINO. Clin. Vet., Milano, 1921, **44**, 441–446.

The author discusses horse sickness as it occurs in the Italian colony of Eritrea, where it is called by the natives "Il mandef." The description given shows the disease to be identical with the horse sickness prevalent in South Africa.—F. W. T.

2425. Morbo coitale maligno e anafilassi. (*Dourine and Anaphylaxis.*) FEDERICO DE GASPERI. Clin. vet., Milano, 1921, **44**, 471–487.

In this article the author discusses experiments upon the sensitization of the animal body with the toxic products of the trypanosomes and the "sensibilisin" to which they give rise. The experiments include ocular and subcutaneous tests upon horses affected with dourine, using trypanosome extract, and experiments demonstrating anaphylaxis in guinea pigs receiving trypanosome extract together with serum from sick horses or serum from rabbits sensitized with trypanosome extract.

The author concludes that there is probably a spontaneous sensitization occurring in sick horses and considers that the exanthematic and edematous manifestations of the disease are due to anaphylaxis resulting from this sensitization. He does not consider this anaphylaxis specific but rather a group reaction.—F. W. T.

2426. Grass Disease. W. T. HEWETSON. Vet. J., Lond., 1921, **77**, 378–381.

Grass disease is the name given to a disease in horses characterized by paralysis of the small colon. Treatment is the principal theme of the paper.—H. C. H. K.

2427. A Note on the Importance of the Genus "Habronema" as an Economic Factor Amongst Equines. E. SEWELL. Vet. J., Lond., 1921, **77**, 381–385.

H. megastoma, *H. microstoma* and *H. muscae* are given as the cause of a disease in equines characterized by marked chronic debility. The *H. megastoma* produces submucosal abscesses in the pyloric region of the stomach and the *H. microstoma* and *H. muscae* cause an inflammation of the mucosa in the cardiac region. Control of the disease rests largely in its prevention. This would consist of the eradication of flies, since they are the intermediate hosts, cleanliness and strict sanitation, isolation of early cases, destruction of the excreta and dosing the animal with a reliable vermifuge.—H. C. H. K.

2428. Studies in Pneumonia in Calves. C. M. CARPENTER AND H. L. GILMAN. Cornell Vet., Ithaca, 1921, **11**, 111–119.

The authors have isolated streptococci, bacilli of the colon-aerogenes group, staphylococci and *Ps. pyocyaneus* from many cases of pneumonia in calves. They have tried to reproduce the disease by administering these organisms intravenously and intratracheally. Pneumonia resulted in some instances. More cases followed the intratracheal injection of extracts made from pneumonia tissue than by the intravenous injection of suspensions of the various organisms. Rabbits inoculated by similar methods yielded results parallel to the injections into susceptible calves.—H. C. H. K.

2429. Pyo-septicemic Infections in New Born Animals. L. C. MAGUIRE. Vet. J., Lond., 1921, **77**, 334.

The writer states that he has completely eradicated white scours in calves by passively immunizing the fetus pre-natally. The cows were injected with autogenous stock bacterins made from previous cases of scours on each farm. They were given 3 injections, 10 days apart, in their seventh and eighth month of pregnancy. The calf was injected at one week of age. The only disadvantage of this is that a separate vaccine must be prepared for each farm and that at least one animal must have become affected before the specific bacillus can be obtained.—H. C. H. K.

2430. The Prevention of Tuberculosis in Cattle. NATHAN RAW. Vet. J., Lond., 1921, **77**, 275.

The author believes he has produced a vaccine that will prevent tuberculosis in cattle, by making monthly subculture transfers for 15 years, first on glycerin potato and then on glycerin agar, then at various intervals making a saline suspended emulsion of the organism as his vaccine. Once each year he has injected susceptible animals with this vaccine with a view to determining its pathogenicity. After 7 years it was found that the cultures were non-pathogenic.—H. C. H. K.

2431. Bovine Lymphangitis. A. L. SHEATHER. Mem. Dept. Agr. India, Calcutta, 1921, **3**, 1–102.

Pus taken from natural cases of lymphangitis reproduced the disease in cattle while similar inoculations into male guinea pigs produced the same results. Cultures isolated from the pus and inoculated gave severe reactions.

A description and discussion of the organism are added with its possible relation to similiar cultures studied by other investigators.—G. J. H.

2432. Pneumonia in Swine with Special Reference to Swine Plague. JAMES W. BENNER. Cornell Vet., Ithaca, 1921, **11**, 154–165.

This article summarizes a rather comprehensive study of *Bacterium suisepticum* and its relation to pneumonia in swine. Attempts were made to prepare an immunizing agent, but this met with almost complete failure. The important features in the control of this disease are herd management with regard to sanitation, feeding and breeding.—H. C. H. K.

2433. Goitre or Bronchocele. E. L. QUITMAN. Vet. Med., Chicago, 1921, **16**, 23–24.

Goitre is defined as a chronic hypertrophy of the thyroid gland. It is the writer's opinion that the cause of goitre is a deficiency condition, either of intra- or extra-deficiency origin. The symptoms of goitre are described in detail. Potassium iodide and calcium iodide are recommended as efficient drugs for the purpose of preventing goitre in newly born pigs or hairless pigs. The above named drugs are said also to be satisfactory for the treatment of animals affected with this condition.—W. L. B.

2434. Die Kleinsche Hühnerseuche. (Klein's Disease of Chickens.) H. VAN STRAATEN AND B. J. C. TE HENNEPE. Folia microbiol., 1918, **5**, 103. Centralbl. f. Bakteriol. (etc.), Jena, Abt. I, Ref., 1921, **71**, 426.

There has been prevalent for a number of years in certain sections of Holland an infectious enteritis among chickens. The disease commonly ends fatally, and it has thus caused considerable loss.

Besides the enteritis, one finds a characteristic bronze discolorative degeneration of the liver.

The disease is in all probability the plague observed by Klein in England in 1888. The bacillus described by Klein was found to be the cause of the disease. It is demonstrable in the blood as well as in the intestinal contents. It is a short, Gram-negative, non-motile bacillus; grows on the ordinary media, does not liquefy gelatin, ferment the various sugars nor change milk.

The disease may be experimentally produced in chickens with the bacillus. It is highly virulent for mice; less virulent for rats, guinea pigs and rabbits.

Protection was afforded chickens against the infection by the injection of bacilli killed at 60°, and with an antiserum produced in a horse.—W. P. B.

PARASITIC DISEASES

(*See also Number 2423*)

2435. *Rhynchobothrium ingens spec. nov., a Parasite of the Dusky Shark* (*Carcharhinus obscurus*). EDWIN LINTON. J. Parasitol., Urbana, Ill., 1921, **8**, 22–32.

From the spiral valve of a dusky shark were obtained 7 large strobiles of a species which on account of the character of the hooks, suggested *Rhyncobothrium speciosum*, originally described from scolices obtained from cysts in various telecosts. It is now recognized as a new species.

The classification of the Tetrarhynchidae, those cestodes with 4 eversible proboscides armed with hooks is still in an unsettled condition. The author has recognized in previous papers 4 genera, which may be recognized from the scolices alone by the following characters.

Bothria 2
  Bothria plain..*Rhynochobothrium*
  Bothria with two eversible, pit-like organs at posterior border....*Octobothrium*
Bothria 4
  Bothria lateral (dorso-ventral)..................................*Tetrarhynchus*
  Bothria terminal...*Synbothrium*

—W. A. R.

2436. *Traitement des Trypanosomiases expérimentales par les acides arseniques.* (*Treatment of Experimental Trypanosome Infections by Arsenical Compounds.*) AUGUSTO NAVARRO. Compt. rend. Soc. de biol., Par., 1921, **85**, 976–978.

Organic arsenical compounds were tested for their therapeutic action in mice experimentally infected with *Trypanosoma brucei* or *Trypanosoma rhodesiense*. The Na salt of 3-amino-4-oxyphenyl- arsenic showed a ratio between the curative dose and the tolerated dose of 1 : 5. Acetyl- amino-oxyphenyl- arsenate was less toxic and much less trypanocidal. Other compounds tested were either too highly toxic or were insufficiently active toward the trypanosomes to be of practical utility.—G. H. S.

2437. *A Sarcophagid Parasite of the Common Field Cricket.* CHESTER A. HERRICK. Tr. Am. Micr. Soc., Menasha, 1921, **40**, 116–117.

Larvae of *Sarcophaga kellyi* Aldrich were found inhabiting the body cavity of black field crickets, *Gryllys assimilis* Fabricius at Manhattan, Kansas, in September, 1920. This seems to be a new case of parasitism in the black field cricket.—J. H. B.

2438. *Recent Advances in Parasitology.* E. C. FAUST. Tr. Am. Micr. Soc., Menasha, 1921, **40**, 75–88.

A brief summary of recent work with a bibliography appended.—J. H. B.

TROPICAL DISEASES

(*See also Number 2604*)

2439. *The Anti-typhus Campaign in Serbia Considered in Connection with the Present Typhus Epidemic in Poland.* R. P. STRONG. Internat. J. Pub. Health, Geneva, 1920, **1**, 7.

The author gives a history of the typhus epidemic in Serbia in 1915, discussing in considerable detail the measures employed in preventing the further spread of the disease. The sanitary condition of the Serbian people with reference to the spread of body lice is discussed and methods of delousing are described. An historical summary of the previous epidemics is given.—P. D. M.

2440. *Notes on Typhus.* S. B. WOLBACH, J. L. TODD AND F. W. PALFREY. Internat. J. Hyg., 1921, **1**, 211.

A report of the typhus research commission of the League of Red Cross Societies in which the possible connection of *Rickettsia prowazeki* as the etiological agent in typhus is brought out.—P. D. M.

2441. *Notes on Rickettsia.* E. HINDLE. Parasitology, Cambridge, 1921, **13**, 152–159.

Examination of a series of lice from persons known not to have been exposed to trench fever or typhus revealed only two specimens infected with *Rickettsia*. Comparing these results with those of previous investigators confirms the view that there may be a *Rickettsia* specific to the body louse.

Lice from the same source were then fed daily for 14 days on a patient suffering from trench fever. At the end of this period 14 out of 22 lice were heavily infected with *Rickettsia*. The feces were also found to be infected.

A number of insects from various sources was also examined. Of numerous sheep-keds the large proportion harbored *Rickettsia melophagi*. Seven to 8 per cent of the mallophagan, *Trichodectes pilosus* from the horse were infested with a new species to which the name *Rickettsia trichodectae* is given. It is interesting to note that this horse louse does not suck blood. The goat louse, *Linognathus stenopsis* was found to harbor a new species designated as *Rickettsia linognathi*.

Up to the present time 9 species of *Rickettsia* have been recorded. All of these inhabit the alimentary canal of Arthropods, and in addition two of them also occur in the blood of man and are associated with human disease (*R. prowazeki* and *R. quintana* in the body louse, causing respectively, typhus and trench fever.)

It seems probable that the *Rickettsia* represent a group of microörganisms which primarily inhabit the alimentary canal of insects and other Arthropods.

With regard to *R. quintana* and *R. pediculi* it seems not unreasonable to assume that we have here an example of a *Rickettsia* normally inhabiting the intestine of the louse which is becoming adapted to a parasitic mode of existence in the blood of man.—W. A. R.

2442. Zur Fleckfieber-Aetiologie. (*The Etiology of Typhus Fever.*) E. Friedberger and F. Schiff. Berl. klin. Wchnschr., 1921, **58**, 293–296.

Attention is drawn to the fact that the typhus fever virus is not filterable and is not inheritable among lice. Friedberger in 1917 urged that *Bacillus* X_{19} of Weil and Felix was the etiological agent in typhus fever, and present experimental evidence removes all objections to this hypothesis. There is an "O" and an "H" form of *Bacillus* X_{19}. Rabbit immune sera produced by the "O" form show serological properties identical with human typhus serum. X_{19} produces the same lesions in the guinea pig brain that are produced by typhus virus. Experiments are reported upon the use of the pure "O" strain of *Bacillus* X_{19} in agglutination tests on guinea pigs and rabbits. It was found that prior injection of typhus passage virus gives protection against a multiple lethal dose of X_{19}. Passive protection was also obtained by the use of serum from rabbits previously treated with guinea pig virus.

More careful trials are being made of isolating X_{19} from the stools of typhus patients. —B. C.

2443. Zur Differentialdiagnose des Maltafiebers. (*The Differential Diagnosis of Malta Fever.*) Alfred Luger. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 321–322.

The clinical symptoms are given in detail. The agglutination test of the causative organism is still under controversy. Spontaneous agglutination occurs readily, and careful controls are necessary. Heating the serum for half hour at 56° destroys a large proportion of the normal agglutinins and leaves the specific agglutinins unaffected. By the latter procedure, agglutination in dilutions of 1:200 to 1:400 is considered diagnostic.—B. C.

2444. Malaria Hemoglobinuria. F. M. Thornhill. N. Orl. M. & S. J., 1921, **74**, 224–232.

While malaria never induces a hemorrhagic tendency as a primary effect, there is a well-grounded belief in the minds of most physicians that malaria is in some way concerned in the production of hemoglobinuria. A strong circumstance in favor of this view is the frequency with which it occurs in malarial sections, coupled with a history of previous attacks of malaria in the majority of cases, while it never seems to originate in non-malarious localities.

There is some clinical and experimental evidence that there is a certain causal relation between quinine administration and hemoglobinuria. The attack sometimes occurs almost with the abruptness of an explosion and is probably due to the liberation of a large number of dead parasites into the blood stream and the rapid diffusion of their toxins into the system. "If this theory be correct, manifestly the gravity of the condition would be greatly increased by giving quinine at this juncture."—W. A. R.

2445. Die deutsche Tropenmedizin vor 25 Jahren und Später. (*German Tropical Medicine Twenty-five Years Ago and Since.*) C. Mense. Arch. f. Schiffs- u. Tropen-Hyg., Leipz., 1921, **25**, 2–13.

This is a review of the advances in tropical medicine, especially since 1884, and the part played by German investigators in those advances.

The Institut für Schiffs- und Tropen-Hygiene was founded in 1901. There have been important advances in bacteriology and protozoology (and the name of Koch is especially mentioned in these advances), and in dermatology and serology (and the name of Ehrlich is especially mentioned in these advances). Veterinary medicine has grown, and has yielded valuable clinical and experimental material.

He refers to the investigations in malaria, yellow fever, sleeping sickness, trypanosomiases of lower animals, spirochete diseases of man and lower animals, beri beri, plague, cholera and dysentery. German physicians have played their part in increasing the knowledge of animal parasites—of the blood, intestine and skin. German physicians have played a great part in the study of skin diseases, syphilis and venereal diseases.

Vaccination against smallpox was thoroughly carried out in comparatively a few years in the German colonies.—E. R. W.

2446. *Einfluss der Tropenmedizin auf die medizinische Wissenschaft. (Influence of Tropical Medicine on Medical Science.)* H. ZIEMANN. Arch. f. Schiffs- u. Tropen-Hyg., Leipz., 1921, **25**, 14–31.

I. The increased importance of arthropods as transmitters of infectious diseases is discussed, and the participation of tropical medicine in this better understanding. The true transmitters: Culicidae, Psychodidae, Muscidae, Hippoboscidae, Pulicidae, Cimicidae, Reduviidae, Pediculidae, Acarinae, and Ixodoidea (Ixodinae and Argasinae) are passed in review.

II. The increased knowledge of the biology and morphology of the disease transmitters under consideration, which has been brought about by tropical medicine. Thus, in the study of mosquitoes: it is important in epidemiology to know that some anopheles live around houses; that others enter houses only at night; that some breed in running water: difference in resistance: the particular species that transmits different types of malaria in different regions—a certain species will be the important transmitter in one region and not in another. There is the same value in the study of papataci flies, glossina, lice, etc.

III. A number of modern methods of investigation have been made practically useful for modern medicine by tropical medicine; as the development of the Romanowsky blood staining and the valuable results it has given in the study of the blood.

IV. The result-producing influence on the study of disease producers in general. The study of blood parasites: malaria and its sequela, blackwater fever; trypanosomiasis. Amebae and treatment of dysentery; syphilis, yaws; Weil's disease; and yellow fever. In the so-called chlamydozoal diseases, the experimental study of typhus fever has made great advances; and advances have been made in the study of the inclusion bodies in the chlamydozoal diseases.

Of the bacterial diseases, the modern investigation of leprosy and plague has been brought about almost entirely by tropical physicians.

V. Tropical medicine and helminthology. Worms are more common in man and lower animals the farther we go toward the tropics, if there is a high relative humidity; so it is no wonder that the tropical physicians have greatly increased our knowledge of the worms—nematodes, cestodes and trematodes.

VI. The avitaminoses. The tropical studies on beri beri made it possible to properly understand the war or hunger edema; and the same type of investigations have been valuable in the study of pellagra.

VII. Tropical medicine and chemotherapy. Formerly the so-called specifics were mercury against syphilis, salicylates against rheumatism, and quinine against malaria. Attempts to obtain other specifics have given us tartar emetic in the treatment of trypanosomiasis and leishmaniasis; and atoxyl and the other drugs leading up to salvarsan. A great deal of investigation has been made of the mode of action of quinine and its derivatives. The "youngest child" of modern chemotherapy is Bayer's 205 for the treatment of trypanosomiasis.

VIII. Comparative pathology and immunology. There is the tendency of tuberculosis to run an acute course in primitive people, on account of the lack of immune substances, in contrast to chronically infected city dwellers of the white race. Scarlet fever and tetanus are rare in the tropics, though the tetanus bacillus is common in the soil in the tropics: it is suggested that this rarity of tetanus is due to the action of the light and the sun. Appendicitis is rare in the tropics.

Diseases of metabolism (diabetes, arthritis, rickets) require the study of further comparative material. It is generally considered that tabes dorsalis, progressive paralysis, many forms of mental disease, as well as carcinoma, are rare among the primitive people in the tropics. There is need to study the immunity relations of different races to the various infectious diseases, as malaria, yellow fever, wound infection, etc.

The study of housing and clothing in the tropics has given valuable information; as on the problem of cooling houses in the tropics. There have also been experiments looking toward making tropical products available for home industry and food.—E. R. W.

MEDICAL ENTOMOLOGY

(*See also Number 2579*)

2447. *A Contribution to Knowledge of the Blood-sucking Diptera of Palestine, other than Tabanidae.* E. E. AUSTEN. Bull. Entomol. Research, Lond., 1921, **12**, 107–124.

This paper, based upon collections by the author during the campaign of 1917–1918 not only presents notes on the occurrence and habits of blood-sucking Diptera of Palestine, but also describes a number of new species.

Of the 8 recorded species of *Culicoides*, the following 6 are new: *vitreipennis, puripennis, tentorius, odiatus, newsteadi, odibilis*. Other new species are *Simulium flavipes* and *Lipoptena caprina*.—W. A. R.

2448. *Supplementary Account of the Dipterous Larvae Feeding upon Molluscs.* D. KEILIN. Parasitology, Cambridge, 1921, **13**, 180–183.

Several new records supplementary to the detailed discussion (Parasitology, 1919) of dipterous larvae feeding upon molluscs.—W. A. R.

2449. On the Sarcoptes of Man. P. A. Buxton. Parasitology, Cambridge, 1921, **13**, 146–151.

Following his detailed studies of the external anatomy of the Sarcoptes from the horse the author makes careful comparisons and concludes that the mite from the horse and the common species found on man cannot invariably be separated. "Certain minute differences exist in scales and spines but they are not constant, and the measurements overlap. Other characters which have been used for separating these forms appear to be wholly useless. It is convenient to regard these forms as varieties, as many previous authors have done; this is more justifiable on physiological than on morphological grounds."

Mites from a case of Norwegian crusted scabies differed from typical *Sarcoptes scabiei*, var. *hominis* in one character only,—that of the greater size of the spines. It is to be regarded as a variety, *Sarcoptes scabiei*, var. *Scabieicrustosae*.—W. A. R.

2450. The External Anatomy of the Sarcoptes of the Horse. P. A. Buxton. Parasitology, Cambridge, 1921, **13**, 114–145.

This paper presents a detailed study of the external anatomy of one Sarcoptes, that of the horse, to serve as a basis for determining the validity of the numerous very similar species.

For examination it is essential to choose a fluid with the lowest possible refractive index, in order to render the sculpturing of the integument and the fine setae transparent. Water is on the whole the most useful medium. Permanent mounts should be made in gum arabic, as balsam clears so much that it is useless. The specimen is placed in the gum alive and dies rapidly in an extended position.

The gum arabic medium is prepared as follows: distilled water 50 cc., glycerine 20 cc., gum arabic 40 gm., chloral hydrate 50 gm., cocain hydrochlor. 0.5 gm.; dissolve gum in water, add chloral hydrate and cocain, when dissolved add glycerine; filter if necessary.—W. A. R.

2451. On the Nephrocytes of Pediculus humanus. G. H. F. Nuttall and D. Keilin. Parasitology, Cambridge, 1921, **13**, 184–192.

By intra-caelomic injections of ammonia-carmine the authors were able to demonstrate two groups of excretory-accumulating cells similar to the nephrocytes of other insects.

The one group, peri-oesophageal, lies ventrally and consists of large cells aggregated usually in two masses about the oesophagus anterior to the reniform salivary glands.

The second group lies dorsally and consists of disseminated cell aggregates linked with the fat body. This group is apparently equivalent to the so-called pericardial cells of most insects.—W. A. R.

2452. On a New Type of Fungus: Coelomomyces stegomyiae n.g., n. sp., Parasitic in the Body-cavity of the Larvae of Stegomyia scutellaris Walker (Diptera, Nematocera, Culicidae). D. Keilin. Parasitology, Cambridge, 1921, **13**, 225–234.

Among 6 parasitized larvae of *Stegomyia scutellaris* from the Federated Malay States 5 contained the previously described ciliate while 1 harboured a new parasitic fungus, packing the gills and posterior segments in solid masses. As seen by transparency the parasites are oval in shape, 37.5 to 57μ long and 20 to 30μ in diameter, surrounded by a more or less thick yellowish wall. Fragments of mycelium were also to be seen, especially around the midgut and the five anterior intestinal ceca.

An appended list of some 18 parasites of mosquito larvae recorded by various authors is a helpful feature.—W. A. R.

2453. Die Jodcysten. (*The Iodine-Cysts.*) S. L. Brug. Arch. f. Schiffs- u. Tropen-Hyg., Leipz., 1921, **25**, 47–57.

There is a discussion of the various ideas regarding the nature of the iodine-cysts, from Wenyon's discovery of them in 1915; their recognition as cysts of an ameba; and the various suggestions as to what ameba they were. The amebae and the cysts are described and figured; and there are figures of amebae from Prowazek's original preparations.

Confusion of the vegetative amebae with free-living amebae is avoided by examining the stool fresh. The differentiation of the cysts from those of *E. histolytica* is discussed; also the differentiation of the amebae and cysts from *E. nana*.

Brug has studied drawings from Prowazek's original preparations, and agrees with Dobell that the iodine-cysts are Prowazek's *E. bütschlii*. But *E. williamsi* Prowazek and *E. bütschlii* are the same; and *E. williamsi* was described before *E. bütschlii*, so *williamsi* is the species name. *Entamoeba williamsi* Prowazek 1912 = *E. coli* + *Endolimax williamsi*, or *Endolimax williamsi* = *Entamoeba williamsi pro parte*.

Brug holds to his opinion that the ameba belongs to the genus *Endolimax*. So the name is *Endolimax williamsi* Brug, 1919, and *Iodamoeba bütschlii* Dobell, 1919 is a synonym.—E. R. W.

PROTOZOOLOGY

2454. Über einige wenig bekannte Darmprotozoen des Menschen und ihre nächsten Verwandten. (*Some Little Known Intestinal Protozoa of Man, and Their Nearest Relatives.*) W. Nöller. Arch. f. Schiffs- u. Tropen-Hyg., Leipz., 1921, **25**, 35–46.

In most hospitals the stools of patients are examined only bacteriologically, or dry preparations are examined, and many protozoal infections escape detection.

During the war the English showed that it is not difficult to train a large number of physicians to make wet preparations and to diagnose intestinal protozoa. Nöller has simplified the Heidenhain stain so all steps are carried out by the clock, and there is not the necessity of differentiating under the microscope. The smears are prepared, fixed, and the picric acid or iodine removed, in the usual way. They are mordanted in iron alum solution in the incubator for one hour, and washed in running water for one to two minutes. They are then stained in Heidenhain's haematoxylin for one hour in the incubator; washed in running water, and differentiated in 2 per cent iron alum solution for 3½ to 4 minutes for amebae, 1½ to 2½ minutes for intestinal flagellates, and 5 to 6 minutes for infusoria. They are then well washed, and run up through alcohol and mounted in the usual way.

This method has been in use in the examination of the stools of the patients of the tropical institute with satisfactory results.

As the troops returning from the war had been in close contact with troops from the tropics, and had been exposed to infection with intestinal protozoa on account of the conditions under which they lived, a special effort was made to study the stools of the returning soldiers. Chronic amebic dysentery was common, often with enormous numbers of cysts—acute cases with bloody stools were exceptional. In some of the malaria patients, without history of dysentery, there was an enormous number of cysts of *E. histolytica* in the stools; and it is astonishing that these patients never had symptoms of dysentery. In one case, some of the vegetative forms of the amebae were infected with a fungus of the genus *Sphaerita*.

Entamoeba tenuis Kuenen and Swellengrebel, 1917, was observed in 5 persons, 2 with intestinal symptoms and 3 without symptoms. Nöller does not agree with Dobell that *E. tenuis* is a small cyst race of *E. histolytica*, and states that *E. tenuis* feeds on bacteria.

Entamoeba coli was frequently observed, sometimes in heavy infection; and twice the amebae were infected with a large parasite of the genus *Sphaerita*.

Dientamoeba fragilis Jepps and Dobell, 1918, was found in the stools of 2 persons with diarrhea, who had never been in the tropics, and also in the stools of 2 persons without symptoms. In one case the amebae were parasitized by a small *Sphaerita*.

Endolimax nana was observed in only 10 persons—a low figure compared to the findings of the English and American investigators. The author observed his own *E. nana* infection for 6 months, and noted that the amebae were found in large numbers only when there was continued diarrhea; otherwise the amebae and their cysts were scarce. This speaks in favor of the opinion of all observers that *E. nana* is an inhabitant of the higher parts of the intestine. In one case the amebae were heavily infected with *Sphaerita*, and in another case the amebae were infected with a nuclear parasite similar to the parasite mentioned by Tyzzer in 1920 in *Pygolimax gregariniformis*.

Iodamoeba bütschlii (Prowazek, 1912) Dobell, 1919 was observed in 6 persons; and Nöller also studied it in Prowazek's original preparations. In a footnote it is stated that several heavy iodameba infections have been found among the patients at the Institute. Dobell's genus name is accepted by Nöller.

Enteromonas hominis was observed in one case.

Lamblia and trichomonas were common, while chilomastix was rare.

Coccidia were found in the stools of 3 men. . . . .

In the study of lower animals, it was found that 20 per cent of the hogs slaughtered in slaughter houses in Hamburg were infected with iodameba. All cats and dogs fed with dysentery stools containing lamblia cysts had abundance of these flagellates in the small intestine; and there were also spontaneous infections.

In the Tropical Institute, nearly all of the young dogs become infected with coccidia. . . .

In this work, the author undertook to demonstrate the widely distributed infection with common and rare parasites among the persons returning from the war; and also to urge systematic stool examinations.

The finding of iodameba in the hog should lead to a systematic examination of the intestinal fauna of domestic animals and animals living near man. In this way it may be possible to explain the origin of many sporadic cases of amebic, flagellate, and coccidial infection: the rôle of the hog in infection with balantidium has been known for years.

It is also noted that the intestinal amebae of man are often infected with fungi. Attempts to grow these sphaerita-fungi for the purpose of using pure cultures in the fight against the intestinal amebae has so far been without result.—E. R. W.

2455. *Infection with the Flagellates.* E. C. Prentiss. N. Orl. M. & S. J., 1921, **74**, 232–244.

In the southwestern U. S. "patients harboring the trichomona intestinalis and other flagellates are very frequently seen, in fact, forming a considerable percentage of all patients seen by a physician limiting his practice to gastro-intestinal work."

Probably many persons harbor the organisms without effect, but often diarrhea and other symptoms could be accounted for only as the result of their presence. In such cases treatment directed towards the organisms would as a rule quickly relieve the patient of symptoms which would not return until the organisms again became very numerous.

The article includes a discussion of the pathology, clinical types, symptomatology and treatment. Unfortunately, no distinction is made between the various species of flagellate parasites of man, and it would seem that various ones were included in the discussion.—W. A. R.

2456. On a new Ciliate: Lambornella stegomyiae n.g., n.sp., Parasitic in the Body-Cavity of the Larvae of Stegomyia scutellaris Walker. (Diptera, Nematocera, Culicidae.) D. Keilin. Parasitology, Cambridge, 1921, **13**, 216–234.

The protozoan reported by Lamborn as parasitic in the body cavity is made the type of a new genus diagnosed as follows. "A holotrichous parasitic ciliate. *Body* elongate oval, length 50μ to 70μ, maximum width 20μ to 30μ. *Ciliation* dense. *Cytostome* small lozenge-shaped. *Macronucleus* spherical, 10μ to 12μ in diameter; *micronucleus* 2μ to 3μ in diameter, lying in a pheripheral depression of the macronucleus. *Protoplasm* granular, with a few basophil vacuoles. Multiplication takes place by simple transverse fission into two equal parts. *Cysts* hemispherical, 30μ to 40μ in diameter, 20μ high, transparent and structureless, attached to the host's cuticle.—W. A. R.

2457. A Protozoon Pathogenic to Mosquito Larvae. W. A. Lamborn. Parasitology, Cambridge, 1921, **13**, 213–215.

An undescribed flagellate (?) (see Abstract No. 2456), was the cause of the death of a batch of 29 larvae of *Stegomyia scutellaris* in Kuala Lumpur. Even to the unaided eye many of the larvae were characterised by a pearly-white opalescence of the tracheal gills. On microscopic examination this was seen to be due to the presence of a large number of very active, pear-shaped protozoa which, though in most cases restricted to the gills had in the paler larvae pervaded the body cavity and the head, even to the interior of the antennae.—W. A. R.

2458. Studies on the Intestinal Protozoa Found in the Termites of Japan. Makato Koidzumi. Parasitology, Cambridge, 1921, **13**, 235–309.

This interesting and valuable paper presents detailed results and figures of representatives of 8 genera of flagellates, 6 of which are already known to occur exclusively in the intestines of termites, while the other 2 are new and belong to the same group.

The forms are considered in two main groups, (1) the *Trichonympha* series containing those provided with a very large number of flagella, and (2) the *Pyrsonympha* series, those with only 4 or 8 flagellar cords.—W. A. R.

2459. Lankesteria cyclopori n. sp. Grégarine parasite de Cycloporus maculatus P. Hallez. (Lankesteria cyclopori n. sp.; a Gregarine parasite of Cycloporus maculatus P. Hallez.) R. Poisson. Compt. rend. Soc. de biol., Par., 1921, **85**, 967–969.

Descriptions of the life cycle and morphology are given.—G. H. S.

2460. On the Nature of Structures Characteristic of Cnidosporidian Spores. R. Kudo. Tr. Am. Micr. Soc., Menasha, 1921, **40**, 59–74.

An investigation into the composition of the spore membrane, polar filaments, and iodinophilous vacuole of the Microsporidia and Myxosporidia.—J. H. B.

2461. Fresh Water and Marine Gymnostominan Infusoria. L. A. Hausman. Tr. Am. Micr. Soc., Menasha, 1921, **40**, 118–143.

A study of the *Gymnostomina* found in over 1000 samples of water most of which were fresh. The methods of study are described, a Key to the families and sub-families is presented, observations on the recorded species are made, a bibliography and 4 plates are appended.—J. H. B.

ANIMAL PARASITES

(See also Number 2427)

2462. Über Askaridenlarven im Gehirn. (Regarding Ascaris Larvae in the Brain.) F. Fülleborn. Arch. f. Schiffs-u. Tropen-Hyg., Leipz., 1921, **25**, 62–63.

In 1920, Fülleborn reported that a few days after feeding ripe ascaris eggs he found the larvae, not only in the lungs and liver, but also in the kidneys where they caused small hemorrhages into the urinary tubules, just as he had demonstrated after percutaneous infection with strongyloides. He concluded that the larvae in the kidneys had passed from the intestine into the circulation through the liver and lungs, and instead of passing up the trachea to go down the esophagus to the stomach, had passed through the pulmonary veins to the left heart and into the general circulation. They stopped in the fine branches of the arteriolae rectae at the surface of the kidney, and boring out of the blood vessels gave rise to the small hemorrhages.

While Fülleborn concluded that the larvae reached the kidneys through the blood stream, Yoshida apparently concluded that ascaris larvae bored their way into the kidneys from the abdominal cavity.

The question is of some importance, because, if the larvae pass through the lungs and into the general circulation, they should also reach the brain, as well as the kidneys; and they might produce serious disturbance in the brain.

Fülleborn has now actually found ascaris larvae in the brain of animals some days after feeding ripe ascaris eggs. But the brain reacts very slightly to the wandering of the minute larvae, as he never saw brain symptoms in any of his experimental animals. Even the injection of numerous ascaris larvae into the carotid did not produce any brain symptoms. The injection of thousands of filariform *Strongyloides stercoralis* through the carotid directly into the brain did not produce any symptoms. After a week following the feeding there were very few ascaris larvae in the brain, so it is assumed that they returned to the lungs in the circulation.

The larvae are also found in other organs supplied by the general circulation, as the muscles of mastication and the heart.

The author concludes that ascaris larvae which pass the lungs and reach the brain through the general circulation are harmless in man.

In his ascaris dogs, he finds the "worm nodules" in the kidneys, and they are very numerous in the lungs, where they appear macroscopically as tubercles; and he queries whether this may also be the case in man.—E. R. W.

2463. On the Cytology and Life History of the Amoebae. With Descriptions of Two New Species. R. W. Glaser. J. Parasitol., Urbana, Ill., 1921, **8**, 1–10.

In cultures prepared by cutting up adult nematodes of the species *Heterakis papillosa* from the ceca of healthy chickens, and incubating for 15 to 30 days at room temperature, there were obtained two previously undescribed species of amoebae. They were isolated and grown on Musgrave and Clegg's medium, 0.7 of normal alkali, in association with cultures of *Staphylococcus albus*.

The new organisms are tentatively placed in the genus *Amoeba* rather than *Entamoeba* and are designated as *A. commutabilis* and *A. vegetabilis*.

In *A. commutabilis* a modification of the promitotic method of division is described. Agamic division, a kind of sporulation and budding, were noted as methods of multiplication. In *A. vegetabilis* the only method of multiplication found was agamic division.

No evidence was found to support the view that the organisms multiply or pass through any stages within the intestines of chickens, or that they have any relation to blackhead in turkeys and chickens.—W. A. R.

2464. Experimental Ingestion of the Ova of Fasciolopsis buski; also the Ingestion of Adult Fasciolopsis buski for the Purpose of Artificial Infestation. C. H. Barlow. J. Parasitol., Urbana, Ill., 1921, **8**, 40–44.

As it was desirable to find out how long a time is required for a patient to become ova-free, in order to have some time-basis for the dismissal of patients from the hospital wards, ova were washed and swallowed in ordinary gelatine capsules.

In two and a half hours they appeared in the feces. Patients become ova-free in from 1 to 8 days without the use of cathartics and in from 10 hours to 2 days after free catharsis.

After swallowing 2 live flukes, which did not become parasitic, ova appeared in 18 hours and disappeared in 71 hours.

In another experiment one of the live flukes lodged and became parasitic. In this case ova appeared in the stool and did not disappear until a year later, when an anthelmintic was taken and the adult fluke was expelled.—W. A. R.

2465. Larval Flukes from Georgia. E. C. Faust. Tr. Am. Micr. Soc., Menasha, 1921, **40**, 49–55.

A study of cercariae taken from snails at Rome, Georgia, shows 7 new species whose interesting relations to previously described forms are briefly discussed.—J. H. B.

2466. Diagnosis of the Commoner Intestinal Parasitic Infections. C. C. Bass. South. M. J., Birmingham, 1921, **14**, 863–865.

A brief generalized article in which the author calls attention to the value of the insertion into the rectum of a small glass tube for the securing of material for examination. Attention is called to the fact that strongyloides larvae may be overlooked unless a portion of feces is examined before washing the ova by centrifuge.—J. H. B.

2467. Note on a Case of Human Infection with Isospora hominis. Probably Originating in the United States. F. G. Haughwout. J. Parasitol., Urbana, Ill., 1921, **8**, 45–46.

In the feces of an American recently arrived in Manila, P. I., who had been suffering from intermittent diarrhea and abdominal discomfort, there was found a moderately heavy infection of *Isospora hominis* Rivolta, 1878 (emend. Dobell, 1919). The apparent distribution of such infections by troops and the importance of epidemiological studies of cases are pointed out.—W. A. R.

2468. On the Life-History of Helicosporidium parasiticum, n. g., n. sp., a new Type of Protist Parasitic in the Larvae of Dasyhelea obscura Winn. (Diptera, Ceratopogonidae), and in Some Other Arthropods. D. Keilin. Parasitology, Cambridge, 1921, **13**, 97–113.

In the larvae of a Ceratopogonid midge was found a peculiar protist. All stages are usually found free in the body cavity of the host. In several cases they were found either in the fat body or in nerve ganglia.

The parasite forms a new type which is temporarily included in the group of the sporozoa, under the generic name *Helicosporidium*. The new genus is characterized as follows:

Helicosporidium n. g.—Parasitic protist, trophic stage in the form of a small round cell $2-3\mu$ in diameter, with small, spherical nucleus. Schizogonic multiplication very active.

Schizonts forming a small morula of 4µ in diameter, composed of 4 or 8 merozoites, which become free.

Spore (5 - 6µ in diameter) is composed of 4 cells surrounded by a thin wall or sporocyst. Of the 4 cells, 3, which form the real sporozoites, are discoidal, occupying the center of the spore. The fourth cell forms a peripheral spiral filament which surrounds the central cells.

The spores open inside the dead body of their host, by the unrolling of the spiral filament, and the sporozoites are thus liberated.

The spiral filament when unrolled is 60 - 65µ long, pointed at both ends and 1µ thick at its widest portion; its nucleus, 2 - 3µ long, lies 15µ from one end of the filament. This filament is of a very resistant nature. One species known.—W. A. R.

2469. *Notes on South African Larval Trematodes.* E. C. Faust. J. Parasitol., Urbana, Ill., 1921, **8**, 11–21.

"This paper presents ten new species of South African cercariae, in addition to clearing up the details of *Cercaria secobii*, and giving new distribution records for two other species." Including the author's previous studies there is thus constituted a group of 25 well-defined larval trematodes.

In the absence of fresh material 5 per cent formalin is the best preservative. This is especially satisfactory for the study of the digestive tract, and the mucin glands, as well as frequently giving a clearer picture of the germ-cell complex than can be had in the living material.

Since the term "mucin gland" is applicable only to the digestive gland giving a basophilic reaction, the author suggests that the term *cephalic gland* (Cort) be used to designate all such glands, whether basophilic, neutrophilic, or acidophilic.—W. A. R.

2470. *Observations on the Distribution and Life History of Cephalobium microbivorum Cobb and of its Host, Gryllus assimilis Fabricius.* J. E. Ackert and F. M. Wadley. Tr. Am. Micr. Soc., Menasha, 1921, **40**, 97–115.

A report on the finding of a new species of nematode in the common black field cricket in the vicinity of Manhattan, Kansas.—J. H. B.

2471. *On A New Cestode from the Pouched Rat, Cricetomys gambianum.* F. J. Meggitt. Parasitology, Cambridge, 1921, **13**, 193–204.

Inermicapsifer zanzibarensis is based on specimens from the duodenum of the pouched rat, from Zanzibar. A valuable discussion of the position of the genus and a key to the known species are included.

In agreement with Beddard, 1911, it is pointed out that a difference in the formation of the egg capsules alone is hardly sufficient to distinguish two genera but, failing these, *Inermicapsifer* must fall into synonomy with *Zschokkeela*. Decision is reserved until there is a more detailed account of the behavior of the uterus throughout the group.—W. A. R.

2472. *Notes on Two Genera of Ectoparasitic Trematodes from Fresh-water Fishes.* H. J. Van Cleave. J. Parasitol., Urbana, Ill., 1921, **8**, 33–39.

Gyrodactylus fairporti n. sp. is described from specimens taken from *Ameiurus melas* and *Cyprinus carpio* at Fairport, Iowa. The flukes attacked the entire body surface of Ameiurus and were chiefly on the gills of the carp.

Light infestations by an undetermined species of Ancyrocephalus were also observed on the gills of the various fishes, at the same station, in July and August. "Worms of this genus do not seem to develop dangerous infestations such as are reported for the genus Gyrodactylus."—W. A. R.

2473. *The Excretory System in Digenea (Trematoda). IV. A Study of the Structure and Development of the Excretory System in a Cystocercous Larva, Cercaria pekinensis nov. spec.* E. C. Faust. Parasitology, Cambridge, 1921, **13**, 205–212.

The excretory system of the developed *Cercaria pekinensis* consists of a bladder, a drainage channel through the tail and a pair of anterior collecting tubules, each of which receives 8 main (tertiary) branches. Each branch is composed of 2 by 4 by 4 units. The posterior branch cares for the drainage of the tail, including the corresponding flapper. The fundamental pattern of the cercaria is likewise found in the sporocyst.

The author points out that like the laws of cleavage of the embryo and the division of sex cells in the early stages, the problem of the excretory system of the trematode is a problem in mathematical development.—W. A. R.

2474. *Acanthocephala from The Eel.* H. J. Van Cleve. Tr. Am. Micr. Soc., Menasha, 1921, **40**, 1–13.

The author states that 4 valid species of Acanthocephala occur in the intestine of *Anguilla chrysypa*. These are distinctively American species of which 3 are known to occur only in fresh-water fishes. The fourth belongs to a genus which includes but one other species and it is restricted to a single species of fresh-water host. In all of the instances that have been examined carefully there is no evidence of marine species of Acanthocephala inhabiting the intestine of *Anguilla chrysypa*.—J. H. B.

2475. Hémogrégarine parasite d'Aspidophorous cataphractus Schonevelde. (*Hemogregarine Parasite of Aspidophorous cataphractus Schonevelde.*) COLAS BELCOUR. Compt. rend. Soc. de biol., Par., 1921, **85**, 837–838.

The parasite is described and the question of its specificity for this particular host is discussed.—G. H. S.

2476. Hypocoma patellarum n. sp. Actinétien parasite de Patella caerulea. (*Hypocoma patellarum n. sp., Parasite of Patella caerulea.*) JEAN-L. LICHTENSTEIN. Compt. rend. Soc. de biol., Par., 1921, **85**, 796–799.

The parasite is described.—G. H. S.

2477. Ophryoglena collini n. sp., parasite coëlomique des larves d'Ephémères. (*Ophryoglena collini n. sp. Parasitic in the Larvae of Ephemeridae.*) JEAN-L. LICHTENSTEIN. Compt. rend. Soc. de biol., Par., 1921, **85**, 794–796.

The characters which serve to differentiate *Ophryoglena collini* from other species of this parasite are given.—G. H. S.

EPIDEMIOLOGY

(*See also Numbers 2482, 2534, 2538, 2541, 2605*)

2478. World Sanitation: A Twentieth Century Possibility. GEORGE C. WHIPPLE. Internat. J. Pub. Health, Geneva, 1920, **1**, 38.

There are three main channels into which world sanitation must be directed: (1) the safeguarding of home life; (2) the safeguarding of industrial life; (3) the prevention of the transmission of disease. The author enters into a discussion of housing, industrial sanitation, the disposal of human excreta, and water purification. An International Public Health Service, when formed, should consider vital statistics, sanitary surveys, construction of model sanitary works. There is a need for sanitary engineers as well as popular education in sanitaton. —P. D. M.

CARRIERS OF INFECTION

2479. Om behandling av tyfusbacilbaerere. (*On the Treatment of Typhoid Carriers.*) E. MURSTAD. Med. Rev., Bergen, Norway, 1921, **38**, 215; 251.

The treatment of typhoid carriers is discussed. Surgical interference with removal of the gall bladder is the only successful treatment. Of the author's 3 cases, 2 were cured in this manner; the third, however, remained a carrier. The gall bladder of this last case was found upon removal to be completely free of bacilli.—T. T.

2480. A Series Of Fourteen Cases of Paratyphoid Fever "B" Traced to a Carrier. J. E. LINNELL. Pub. Health, Lond., 1921, **34**, No. 9, 172–175.

This series of 14 cases began in August, 1918, 2 years after any reported cases in the neighborhood. The cases, which appeared at irregular intervals in a boy's school, a tuberculosis sanitarium, and several private families, covered a period of 13 months, and were finally traced to a boy on a dairy darm, who began milking in July, 1918. He had been ill the preceding November, with "severe influenza," and laboratory tests in 1919 showed organisms of the paratyphoid group. The cases ceased with the exclusion of the boy from all share in the milk handling.—T. B.

2481. Disease Carriers in South Africa. EDITORIAL. Pub. Health, Lond., 1921, **34**, No. II, 205–206.

A brief report of pending legislation for giving health officials full power to deal with the carrier menace. The main regulations are as follows: (1) a carrier must afford every facility for the obtaining of specimens (blood, discharges, etc.) and must take any medicine prescribed by the government health or medical officers; (2) a magistrate may give an order for hospital or other suitable detention for examination or for control during a reasonable period; (3) a carrier must observe all practicable instruction such as disposal of excreta, cleansing of used articles, etc.; (4) a carrier must inform the proper authorities of changes in residence; on moving to a new locality the facts must be submitted to the new health officers 7 days in advance; (5) parents and guardians are responsible for the carrying out of the regulations for children known to be carriers.

The proposed legislation carries penalties for disobedience of the regulations listed above. —J. B.

PUBLIC HEALTH REGULATION

(*See Numbers 2445, 2478, 2481*)

INDUSTRIAL HYGIENE

2482. Spray Infection. S. R. DOUGLAS AND LEONARD HILL. J. Indust. Hyg., 1921, **111**, 206.

Experiments were carried out by employing two bell glasses of equal size and with ground, flat edge at the bottom and a tubulature at the top. The edges were brought together and held in apposition with vaseline and the nozzle of a spray inserted through one of the tubulatures. The bell glasses were placed in the horizontal position. Three strokes of the spraying pump were then made and the tubulature closed. The bell glasses were then inverted 4 times at intervals of 30 seconds, so as to mix the suspension. They were then separated and each placed on a glass plate for transport and then over the central orifice of a chamber in which Petri dishes were exposed.

Experiments conducted in this way indicate that more colonies develop when the air is warm than when the air is cold, during an equal period of exposure, likewise that more colonies develop when the air is relatively moist than when it is relatively dry.—D. H. B.

RURAL SANITATION

2483. Is Effectual Rural Control of Contagious Disease Possible? W. S. LEATHERS. South. M. J., Birmingham, **14**, 870–874.

The author insists that effectual control of contagious disease in a county becomes possible only as a result of effective and efficient local or county health departments.—J. H. B.

DISINFECTION AND GROWTH INHIBITION

2484. Ueber die durch Metalle, Metallsalze und flüchtige Desinfizienten hervorgerufenen keimfreien Höfe auf Bakterienplatten. (The Sterile Zones Produced by Metals, Metal Salts and Volatile Disinfectants upon Bacterial Plates.) ALFRED LUGER. Wien klin. Wchnschr., 1920, **33**, 833–836.

An effect at a distance could not be demonstrated for mercuric chloride, for copper or for silver. In the case of mercuric chloride, sublimation actually transfers some of the poison to the plates. The sharp zone formed about metals and salts upon plates is due to ordinary diffusion processes characteristic for gels. Liesegang's phenomenon is also observed in these experiments.—B. C.

2485. Sur le pouvoir antiseptique de quelques couleurs d'aniline. (Antiseptic Action of some Aniline Dyes.) J. BRIDRÉ. Compt. rend. Soc. de biol., Par., 1921, **85**, 645–646.

Results are recorded as follows:

Test organism, Staphylococcus: Inhibition of growth by	
Methylene blue	1:30,000
Benzyl violet	1:500,000
Hexamethyl violet	1:1,000,000
Brilliant green	1:1,000,000
Test organism, *B. of Preisz-Nocard:* Inhibition of growth by	
Methylene blue	1:30,000
Benzyl violet	1:1,000,000
Hexamethyl violet	1:4,000,000
Brilliant green	1:1,000,000
Test organism, *Bact. diphtheriae:* Inhibition of growth by	
Benzyl violet	1:500,000
Hexamethyl violet	1:5,000,000
Brilliant green	1:1,000,000

Different culture media, and media containing serum, cause some modification in these values. —G. H. S.

2486. Recherches comparatives sur l'action microbicide des vapeurs de quelques essences vegetales. (The Bactericidal Action of the Vapors of Some Vegetable Essences.) A. MOREL AND A. ROCHAIX. Compt. rend. Soc. de biol., Par., 1921, **85**, 861–863.

The meningococcus, *B. typhosus*, staphylococcus, *Bact. diphtheriae*, and *B. anthracis* spores were subjected to the vapors of a large number of essential oils. In general, the meningococcus was the most sensitive to all substances. *B. typhosus* was somewhat susceptible to some compounds, the other organisms less so. *B. anthracis* spores were not killed. Citron, thyme and orange oils showed the greatest bactericidal action.—G. H. S.

WATER AND SEWAGE BACTERIOLOGY

2487. Om forurening af drikkevand med tarmbakterier. (Pollution of Drinking Water with Intestinal Bacteria.) ERIK BONDO. Nord. hyg. Tidsskr., 1921, **2**, 13.

The author has made a study of the lactose fermenters in drinking water and has tried to classify them as belonging to warm blooded or cold blooded animals. He has used a series of colorimetric pH measurements, according to Clark and Lubs. He did not succeed in finding differences in acid production with *B. coli* from warm blooded or from cold blooded animals. He found, however, that indol production was negative with the cold blooded and positive with a majority of warm blooded strains.—T. T.

FOOD BACTERIOLOGY

(See also Numbers 2411, 2605)

2488. *A Souring of Beef Caused by Bacillus megatherium.* H. Bunyea. J. Agric. Research, Wash., 1921, **21**, 689–698.

In studying a condition of beef known as souring, the author isolated cultures of organisms by making preparations with a platinum spatula from deep incisions of the specimen. The cultures isolated were studied and their characteristics noted.

The data collected indicate that the souring of beef is caused by bacterial action and the organism largely responsible is *Bacillus megatherium*. In the presence of oxygen, this organism will sour beef under a wide range of temperatures with the production of propionic acid.

The particular strains of the organism isolated proved non-pathogenic for rabbits and guinea pigs and did not produce an appreciable amount of toxin when propagated upon raw beef.—G. J. H.

HEALTH BOARD LABORATORY METHODS

2489. *Sur l'homogénéisation des crachats tuberculeux par auto-digestion spontanée.* (*Homogenization of Sputum through Spontaneous Auto-digestion.*) M. Favre and J. Devuns. Compt. rend. Soc. de biol., Par., 1921, **85**, 858.

Sputum is simply allowed to stand for some time, during which an auto-digestion takes place, and then material from the deeper portions of the tube is examined for *B. tuberculosis*. —G. H. S.

DIATHETIC AND DEFICIENCY DISEASES—VITAMINES

2490. *Sur le rôle des microorganismes dans la production des vitamines.* (*The Rôle of Microorganisms in the Production of Vitamines.*) E. Wollman. Compt. rend. Soc. de biol., Par., 1921, **85**, 801–803.

No evidence could be found that *B. bulgaricus* produced any antiscorbutic vitamine, or that Amylobacter produced antineuritic vitamine.—G. H. S.

CANCER RESEARCH

(See also Number 2555)

2491. *Tar Sarcoma in Rabbit.* Yamagiwa, et al. Mitt. a. d. med. Fakult. d. k. Univ. zu Tokyo, 1920, **25**, 189 (abs. in J. Am. M. Ass., 1921, **77**, 823).

A fibromyxosarcoma developed in the mamma of a rabbit 23 months after the beginning of a course of 31 injections into the breast. The growth recurred after excision, and fragments of it grew when transplanted into other rabbits. This was the only tumor which developed in 200 rabbits treated.—W. H. W.

2492. *Further Studies on the Transplantation of Cancer.* M. Nagayo and H. Wago. Gann, 1921, **15**, 9.

It seems not impossible that by means of suitable grafting methods some transplantable tumors can be grafted in heterogeneous animals with more or less success. For example, treatment with serum of the species furnishing the tumor appeared to favor growth. —W. H. W.

2493. *The Experimental Production of Sarcoma of the Liver of Rats.* F. D. Bullock and M. R. Curtis. Proc. N. York Path. Soc., 1920, **20**, 149.

Sarcoma of the liver has been produced in 210 rats through the mediation of *Cysticercus fasciolaris*, the larval stage of *Tenia crassicollis* of the cat. The length of time necessary is 8 months or more. These sarcomata grow invasively, metastasize, and are easily transplantable into other rats.—W. H. W.

2494. *Relation between Grafting Percentage and the Seasons.* H. Wago. Gann, 1921, **15**, 20.

The inoculation outcome was not so good during the summer as during the cooler months. —W. H. W.

2495. *Copper in Tumors and in Normal Tissues.* C. P. White. Lancet, Lond., 1921, **2**, 701.

Copper appears to be universally present in animals and in plants. It is present in degenerating tumors to a greater extent than in healthy ones.—W. H. W.

2496. *Beiträge zur Kenntnis einiger durch Bacterium tumefaciens hervorgerufenen Pflanzengeschwülste.* (*Plant Tumors Produced by Bacterium tumefaciens.*) F. Blumenthal and H. Hirschfeld. Ztschr. f. Krebsforsch., Jena, 1921, **18**, 110.

These growths, interesting though they are, cannot be regarded as proof that cancer in man and in animals is a parasitic disease.—W. H. W.

DISEASES OF THE BLOOD, LYMPHATICS AND DUCTLESS GLANDS

(*See also Numbers 2433, 2530*)

2497. Om agglutination og haemolyse ved blodtransfusion. (*Agglutination and Hemolysis in Blood Transfusion.*) **Fredrik Jervel.** Norsk Mag. f. Laegevidensk., Kristiania, 1921, **82**, 329.

The author has studied the blood groups as they occur in Norway and finds the following percentages, using the Moss classification: Group I, 4.3 per cent; Group II, 49.8 per cent; Group III, 10.3 per cent; Group IV, 35.6 per cent.—T. T.

2498. Transfusion av citratblod ved et tilfaelde av perniciøs anaemi. (*Transfusion of Citrated Blood in a Case of Pernicious Anemia.*) **Carl Müller and Fredrik Jervel.** Norsk Mag. f. Laegevidensk., Kristiania, 1921, **82**, 442.

The first transfusion brought about improvement in the patient's condition and it was found that the transfused corpuscles were alive for at least 5 weeks in the blood of the recipient. The second injection had a less beneficial effect and the transfused corpuscles remained alive for only about 12 days. After the third injection the patient became worse, he developed a severe jaundice and died with symptoms of insufficiency of the liver.—T. T.

2499. Neutrophilic Myelocytes in the Cerebrospinal Fluid of a Patient Suffering from Myeloid Leukemia and Their Significance for the Diagnosis of Myeloleukemic Infiltration of the Leptomeninges. **Lewellys F. Barker.** South. M. J., Birmingham, 1921, **14**, 437–441.

A report of a case in which it was possible during life to demonstrate in the cerebrospinal fluid the presence of cells of leukemic origin. No other case has been reported in which leukemic cells were found in the cerebrospinal fluid during life. The author believes this finding is indicative of a leukemic infiltration of the leptomeninges.—J. H.B.

DISEASES OF THE DIGESTIVE SYSTEM

(*See also Numbers 2454, 2479, 2583*)

2500. En liten dysenteriepidemi foraarsaket av dysenteribaciller av gruppe I (*Shigas bacil*). (*A Small Epidemic of Dysentery Caused by Dysentery Bacilli of Group I* (*the Bacillus of Shiga*).) **Th. Thjøtta and Odd Falsen Sundt.** Nord hyg. Tidsskr., 1921, **2**, 1.

The authors studied an epidemic of dysentery occurring in the eastern part of Norway, near Kristiania. The infecting bacterium was found to be the bacillus of Shiga, which the authors name Group I in accordance with the nomenclature of Thjøtta. This is the first time this bacillus has been isolated in Norway. It seems, however, likely that it must have been present in earlier epidemics, as severe epidemics of dysentery have been seen in the country. The authors thus mention an epidemic in 1859, wherein occurred more than 4000 cases with more than 600 deaths. Likewise an epidemic in 1902 is mentioned in which there were 11 cases and 10 deaths.

In the epidemic studied there were only 6 cases, but 4 of these died. It was a peculiar feature in this epidemic that it was completely impossible to trace the infection back to any other case of dysentery, nor to any possible mode of infection. Neither did it give rise to a single case outside of the infected farm. It suddenly arose on the farm and just as suddenly died out again.

The authors, who have seen a number of dysentery cases due likewise to the less toxic strains of Group II and Group III call attention to the fact that it is impossible at the onset of an epidemic to draw any conclusions from the clinical aspect of the disease as to the infecting group of dysentery bacilli, wherefore it is of the greatest importance to have a bacteriological diagnosis made as soon as possible.—T. T.

2501. Die klinische Bedeutung der Trypanoziden Serumsubstanz für die Serodiagnose der Leberinsuffizienz. I. (*The Clinical Significance of the Trypanocidal Serum Substance in the Serodiagnosis of Liver Insufficiency. I.*) **F. Rosenthal and M. Krueger.** Berl. klin. Wchnschr., 1921, **58**, 382–386.

The trypanocidal action of human sera was studied upon *Trypanosoma brucei* infections in white mice. In certain cases of disturbed liver function in man, the serum loses much of its trypanocidal power. The disappearance of this power in the absence of icterus is not a perfect criterion of subtle damage to the liver parenchyma, but rather a serologic symptom of severe functional disturbance of the diseased organ *in toto*. Bile constituents like bilirubin, cholesterol and bile salts in the maximum concentration occurring in icteric serum are unable to reduce the trypanocidal substance of normal serum *in vitro*. The trypanocidal titer of human serum is closely related to the functional integrity of the liver. It is highly probable that this organ is the producer of the trypanocidal serum constituent. This phenomenon constitutes a new physiological function of the liver, and furnishes a serodiagnostic method for testing liver function.—B. C.

2502. *Die akute infektiöse stomatogene Hepatose.* (*Acute Infectious Stomatogenous Hepatosis.*) FELIX PIELSTICKER. Deutsche med. Wchnschr., Berl. & Leipz., 1921, 47, 289–290.

Liver enlargement of acute onset, accompanied by considerable general malaise, was found to occur during mid-summer in a number of cases. There also occurred some subicteric pigmentation, and almost without exception inflammation of the gums was present. The other organs remained unaltered, the urine contained no protein or abnormal sediment, and the feces retained their normal color. A primary degenerative change of the liver parenchyma appars to be present. The associated gingivitis is due to the Plaut-Vincent organisms, and Pielsticker offers the hypothesis that the hepatosis is also caused by these organisms. The infection is characterized as a filth disease.—B. C.

2503. *Ueber Cholangitis typhosa.* (*Typhoid Cholangitis.*) GUSTAV NEUGEBAUER. Deutsche med. Wchnschr., Berl. & Leipz., 1921, 47, 381–382.

A case is described.—B. C.

DISEASES OF THE GENITO-URINARY SYSTEM

(*See also Numbers 2393, 2513, 2525, 2543, 2562, 2567, 2574, 2592*)

2504. *Ueber Fluoreszenzfärbung von Spirochäten im vital gefärbten Dunkelfeldapparat.* (*Fluorescent Staining of Spirochetes in the Vitally Stained Dark-Field Preparation.*) F. W. OELZE. München. med. Wchnschr., 1920, 67, 1354.

If a drop of exudate from a syphilitic lesion be added to a drop of saturated aqueous china blue solution, and the mixture examined in the dark field, it will be observed that some of the normally motile spirochetes are colored red while others remain unstained. This shows that the organism is stainable only during some period in its existence. The dark field pictures obtained with acid china blue combined with cyanosin are due partially to fluorescence, and are particularly striking.—B. C.

2505. *Die Jarisch-Herxheimersche Reaktion mit besonderer berücksichtigung des Mirions.* (*The Jarisch-Herxheimer Reaction with Especial Respect to Mirion.*) M. OPPENHEIM. Wien klin. Wchnschr., 1921, 34, 278–280.

The reaction consists of an exacerbation of syphilitic efflorescences following the first administration of specific drugs like mercury. Mirion, an iodine preparation, also produces this reaction. The reaction is, however, not specific for syphilis and is no absolute proof of the specificity of a drug. It is merely the expression of what Bier terms recovery inflammation.—B. C.

2506. *Die Bewertung der durch Hg-Behandlung negativgewordenen Wa. R.* (*The Significance of the Wassermann Reaction Made Negative by Mercury Treatment.*) MAX FUNFACK. Deutsche med. Wchnschr., Berl. & Leipz., 1921, 47, 330.

It appears still doubtful that the lipoid cell products, or indirectly the spirochetes themselves are the responsible factors in the positive Wassermann reaction. The presence of virulent spirochetes need not exclude a negative Wassermann test. A case is reported in which the spirochetes were able to produce new syphilitic efflorescences in spite of the large dosage of mercury and the return of a negative Wassermann test.—B. C.

2507. *Ueber die Kombination der operativen Therapie der Genital-Tuberkulose mit der Röntgenbestrahlung. Prophylaktische Bestrahlung.* (*The Combination of Operative Therapy with X-ray in Genital Tuberculosis. Prophylactic Irradiation.*) E. VOGT. Deutsche med. Wchnschr., Berl. & Leipz., 1921, 47, 293–294.

Following surgical treatment of genital tuberculosis in the female, prophylactic irradiation with X-rays was found to be beneficial in 30 cases as compared with others which were not so treated.—B. C.

2508. *Zur Frage der Parasyphilis.* (*The Parasyphilis Question.*) LÜNENBORG. Deutsche med. Wchnschr., Berl. & Leipz., 1921, 47, 386.

Syphiliform ulcers of the oral mucosa have been found frequently in patients denying venereal infection. It would seem that mouth spirochetes might be responsible in such cases. —B. C.

2509. *Ueber die Beeinflussung syphilitischer Exantheme durch die Lumbalpunktion.* (*Influencing Syphilitic Exanthems by Lumbar Puncture.*) KARL SCHREINER. Wien klin. Wchnschr., 1921, 34, 265–266.

Exanthem and efflorescences receded markedly following lumbar puncture, though no other treatment was pursued.—B. C.

2510. *Tabes und Früh-Syphilis.* (*Tabes and Early Syphilis.*) EMIL FRIEDLÄNDER. Berl. klin. Wchnschr., 1921, 58, 317–321.

One case, at least, is cited which presents the picture of a fully developed tabes dorsalis coincident with fresh primary infection with syphilis. Whether the latter is a super-or a reinfection remains undecided.—B. C.

2511. *The Saprophytism of Venereal Organisms and its Dangers.* H. GOUGEROT. Internat. J. Pub. Health, Geneva, 1920, 1, 172.

The author contends that evidence proves the reality of the saprophytic existence of venereal organisms on mucosae which appear free from lesions. Cases of this sort constitute "carriers" of venereal disease and present a public health problem of importance. Patients supposedly cured should be kept under clinical and bacteriological examination.—P. D. M.

DISEASES OF THE LOCOMOTOR SYSTEM

(See also Number 2535)

2512. *Ueber Osteomyelitis acuta und subacuta der Wirbel.* (*Acute and Subacute Osteomyelitis of the Vertebrae.*) P. G. PLENZ. Deutsche med. Wchnschr., Berl. & Leipz., 1921, 47, 416–417.

The difficulties of accurate diagnosis are demonstrated in the 3 cases described. The main general symptoms are, (1) severe general septic condition, (2) high hyperleucocytosis, and (3) local pressure symptoms with edematous swelling near the involved segment.—B. C.

2513. *Caries ossium non tuberculosa.* (*Non-Tuberculous Bone Caries.*) F. HAMBURGER AND PH. ERLACHER. Wien. klin. Wchnschr., 1921, 34, 253–254.

An unusual case is described, in which tuberculosis could not be demonstrated by any test, though the clinical picture suggested this disease.—B. C.

DISEASES OF THE NERVOUS SYSTEM

(See also Numbers 2499, 2567)

2514. *The Serological Classification of Meningococci.* PAUL FILDES. Brit. J. Exper. Path., Lond., 1920, 1, 44–52.

A study was made of 21 strains of meningococci taken from cases in the Navy during 1917-18. They were classified according to the relationships of their agglutinin absorption reactions as tested with a polyvalent horse serum, without reference to the 4 Gordon type strains. They fell into 2 distinct serological groups. Each main group consisted of bacteria with 2 main serological characters, and also bacteria with these main characters merged into one another to a greater or less extent. One of the main groups was found to include Gordon's I and III type strains; the other included Gordon's Type II and Type IV strains. Two of the strains found did not react with the polyvalent serum, and absorbed agglutinins for themselves only, but the strains of the large group A and its subgroup B (corresponding to Gordon's Types I and III) absorbed the agglutinins for these two strains.

The author concludes, therefore, that the grouping into Gordon's 4 types does not depend upon a selection of standards, since it emerged from this experiment in which no standards existed. Further, strains may occur commonly which do not belong distinctly to any of Gordon's types but fall between them. If agglutination by four mono-typical sera is taken as the basis for the diagnosis of meningococci for the future, serious error is likely to be introduced.—A. C. E.

2515. *Zur Therapie der eitrigen Meningitis cerebrospinalis.* (*Therapy of Purulent Cerebrospinal Meningitis.*) B. HARTMANN. Deutsche med. Wchnschr., Berl. & Leipz., 1921, 47, 357.

Frequent lumbar punctures and flushing of the dural cavity with physiological saline are helpful procedures. A marked improvement occurs simultaneously with the injection of autogenous vaccines. The treatment of a case is described.—B. C.

2516. *The Experimental Transmission of Encephalitis Lethargica to a Monkey.* JAMES MCINTOSH AND HUBERT M. TURNBULL. Brit. J. Exper. Path., Lond., 1920, 1, 89–102.

A *Macacus rhesus* monkey was inoculated intra-cerebrally and intraperitoneally with the unfiltered emulsion of pieces of the cervical cord, pons and basal nuclei from a fatal human case of encephalitis lethargica. This monkey proved to be tuberculous, and the results were considered of no great significance. A *Cercopithecus patas* monkey was inoculated in the same manner with the filtrate from the same emulsion. Symptoms appeared 6 days later, and death occurred on the 57th day. The clinical manifestations in the monkey resembled with considerable closeness those of human encephalitis lethargica. The histological changes reproduced in exaggerated form the chief characteristics of human encephalitis lethargica: inflammatory infiltration was very strictly localised, and was confined to the areas chiefly affected in the human disease. The finer histological features were also reproduced: the grosser forms of cellular necrosis were not found; neurono-phagia was very slight; a search with special methods for emigrated granular leucocytes revealed only one such cell.

A detailed description of the microscopic findings is given together with 4 plates.—A. C. E.

2517. *Présence du virus encéphalitique dans la liquide céphalorachidien.* (*Presence of the Virus of Encephalitis Lethargica in the Spinal Fluid.*) C. KLING, H. DAVIDE AND F. LILJENQUIST. Compt. rend. Soc. de biol., Par., 1921, **85**, 823–827.

The virus of encephalitis lethargica was demonstrated in the spinal fluid of a case of the disease. The lesions resulting in the rabbit were characteristic of experimental encephalitis. They were culturally sterile and yielded material which reproduced the lesions in other animals.—G. H. S.

2518. *Om encephalitis letargica.* (*On Encephalitis Lethargica.*) R. BAKKE. Med. Rev., Bergen, Norway, 1921, **38**, 62.

Pathological study of the disease.—T. T.

2519. *Myelo-Encephalitis epidemica.* (*Epidemic Myeloencephalitis.*) A. BÖHME. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 319–320.

The clinical appearances of this disease are described. Since epidemic encephalitis becomes prevalent after influenza has subsided, it would appear improbable that both these diseases are due to one causative agent.—B. C.

DISEASES OF THE RESPIRATORY SYSTEM (EXCEPT INFLUENZA AND TUBERCULOSIS)

(*See also Number 2573*)

2520. *Les types pneumococcus d'Avril 1919 a Mars 1921.* (*Types of Pneumococci Found between April, 1919 and March, 1921.*) E. SACQUÉPÉE. Compt. rend. Soc. de biol., Par., 1921, **85**, 639–641.

Of the 36 strains isolated 34 could be typed. The agglutinations gave the following classes:

Single type present..	Type I, 0 Type II, 23 Type III, 3	26
Mixed types present..	Types I and II, 4 Types II and III, 4	8

These types are based upon reactivity with the three specific type sera of Truche. The preponderance of strains showing the II antigenic grouping is commented upon.—G. H. S.

2521. *Les types de Pneumocoques dans les complications pulmonaires de la grippe.* (*The Types of the Pneumococcus Present in the Pulmonary Complications of Influenza.*) E. SACQUÉPÉE. Compt. rend. Soc. de biol., Par., 1921, **85**, 770–772.

The influenza epidemic of April, 1921, presented many severe pulmonary complications; pneumonia and bronchopneumonia. The pneumococci isolated from these cases have been typed according to the antigenic groups present (I, II, and III). In the pneumonias the distribution of types was; I in 27 per cent, II in 90 per cent, and III in 36 per cent of the cases. (The presence of mixed infections accounts for the percentages given.) In the bronchopneumonias, single and multiple infections, the type distribution was; I in 64 per cent, II in 57 per cent, and III in 64 per cent. In the bronchopneumonias the mixed types were present in 71 per cent of the cases; in the pneumonias in 63 per cent. As compared with the pneumonias occurring in periods free from influenza, this percentage of mixed infections is very high. —G. H. S.

2522. *Ein Beitrag zur Differentialdiagnose der käsigen Pneumonie und der produktiven Tuberkulose nach der Ballin'schen Methode.* (*The Differential Diagnosis of Caseous Pneumonia and Proliferative Tuberculosis by Ballin's Method.*) KURT FREUNDLICH. Berl. klin. Wchnschr., 1921, **58**, 351–352.

Ten cc. sputum is mixed with 10 cc. of 10 per cent KOH, well shaken and heated until completely liquefied. Then 3 cc. of water is added and the mixture centrifuged at high speed. The elastic fibers are to be found in the sediment. Ten cases were followed clinically and later the diagnosis was confirmed at autopsy The elastic fibers in the sputum in 5 cases were found to occur only in alveolar form, and this together with the clinical and X-ray evidence pointed to presence of caseous pneumonia. All the autopsies confirmed this diagnosis. In the other 5 cases where the elastic fibers in the sputum occurred in the form of scattered bundles together with alveolar structures, the anatomical diagnosis was indurative tuberculosis in combination with caseous pneumonia.—B. C.

2523. *Endokarditis und Meningitis durch Streptococcus viridans.* (*Endocarditis and Meningitis Due to Streptococcus viridans.*) W. SAWITZ. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 288–289.

A case is described in detail. The apparently mild endocarditis of long duration was followed by meningitis and death.—B. C.

2524. *Zur Salvarsantherapie der Lungengangrän.* (*Salvarsan Therapy of Pulmonary Gangrene.*) BÉLA MOLNÁR, Jr. Wien. klin. Wchnschr., 1921, **34**, 255.

In 6 cases it was found that the sooner the salvarsan therapy was begun the more favorable the results.—B. C.

2525. *Anatomie pathologique des pneumonies syphilitiques. (Pathological Anatomy of Syphilis of the Lung.)* P. I. Elizalde. Compt. rend. Soc. de biol., Par., 1921, **85**, 958–959.

The development of the lesions characterizing gumma of the lung is described.—G. H. S.

INFLUENZA

(*See also Number 2521*)

2526. *The Aetiology of Influenza.* Paul Fildes and James McIntosh. Brit. J. Exper. Path., Lond., 1920, **1**, 119–126; 159–174.

A history of the theories in regard to the cause of influenza is given, and there is a lengthy consideration of the modifications which may be made in "Koch's postulates" in their modern application to research upon the etiology of disease.

Investigators in nearly every country have described an ultramicroscopic virus as the cause of influenza. After a review of the literature claiming that influenza is caused by a filter-passing virus the authors state that the experiments are unconvincing. Those who have repeated this work with negative results have usually not published it. Some experiments by one of the authors are summarized showing negative results when monkeys were inoculated with filtered material from influenza cases.

The literature on the incidence of *B. influenzae* in influenza is reviewed, and the conclusion is drawn that there can be no doubt that with a satisfactory technique it can be demonstrated in such a large number of cases that it qualifies for being considered of etiological importance. Not only is it present in a large proportion of cases but it has a close relationship to the lesions of the disease. It is true that it is found in a number of conditions which are not influenza and in a large number of normal persons, at any rate during epidemic periods, but these facts do not in themselves militate against its being the cause of influenza.

Although the attempts to demonstrate directly a pathogenicity of *B. influenzae* to man have been almost uniformly unsuccessful, nevertheless the constant occurrence of antibodies to this bacillus in the serum of patients makes it clear that it has a definite pathogenic action, which cannot, however, be reproduced. The presence of the antibodies may be taken as evidence that the bacillus is a pathogenic organism such as might be the cause of influenza, but not that the characteristic lesions of this disease are due to this pathogenic bacillus.

Summing up the evidence of pathogenicity of *B. influenzae* to animals, it may be accepted as established that fairly constant lesions may be produced by certain cultures applied in particular ways to susceptible animals. The most characteristic lesion to be observed is a bronchopneumonia.

Thus we have a characteristic living organism which is present in the lesions of influenza and has a pathogenic action for man. Pure cultures of this bacillus are capable of producing in animals a condition which has important points in common with influenza in man, and it is only the indefinite nature of the essential lesion of influenza which causes hesitation in accepting the experimental disease in animals as the same as the natural disease in man. If this relationship is accepted, the criteria by which a bacterium should be judged the cause of a disease are fulfilled.—A. C. E.

TUBERCULOSIS

(*See also Numbers 2499, 2507, 2522, 2580, 2584, 2586*)

2527. *Virulence of Tubercle Bacilli Isolated from Bovine Lesions in India.* A. L. Sheather. Mem. Dept. Agr. India, Calcutta, 1921, **3**, 33–70.

In an effort to determine the prevalence of bovine tuberculosis in India and its relation to the virulence of the tubercle bacilli, organisms isolated from 16 cases were inoculated into experimental animals.

When inoculated into guinea pigs the duration of life, of the animal, was from 73 to 183 days while the European strains killed guinea pigs in 8 to 140 days indicating that the Indian strains were less virulent. Control experiments with rabbits confirmed these results.

By repeating these inoculations using 26 cattle, further evidence was secured to indicate that bovine tuberculosis in India is caused by organisms of less virulence than the European varieties.—G. J. H.

2528. *The Importance of Subliminal Symptoms and Period of Alternation of Rest and Exercise In the Treatment of Pulmonary Tuberculosis.* Henry Sewall. Am. Rev. Tuberc., Balt., 1921, **5**, 251–252.

Based on the common experience that clinical deterioration due to tuberculous disease is not only accompanied with but is preceded by more or less well-recognized pathological symptoms, it is maintained that on investigation each patient will commonly disclose a range of symptoms far less obtrusive than those usually apparent to the physician and the recognition of these may lead much earlier than is usual to proper treatment.

Based on the fact that auto-inoculations in the tuberculous subject may lead to disaster or to cure, depending on the phase of vital reaction at which each inoculation succeeds the preceding, it is shown by clinical experience and made reasonable by experimental inquiry that the clinician should take careful account of the length of the rest interval between muscular exertions of certain patients. It has been found that patients whose symptoms persist when even gentle exercise is taken daily may overcome this trouble when exercise is spaced on alternate days. There is probably considerable divergence between the length of the "negative" and of "positive" phases of reaction in different persons and accordingly the spacing of their exercise should differ.

An attempt has been made to draw a parallel between the obscure events marking the course of clinical tuberculosis and the immunological reactions of animals in which the conditions of infection and inoculation can be experimentally controlled.—T. G. H.

2529. Additional Diagnostic Methods for Cases of Suspected Intraocular Tuberculosis. A. H. Canfield. Am. Rev. Tuberc., Balt., 1921, **5**, 253–265.

The author recommends a careful clinical and stereoscopic examination; the simultaneous use of the inhibitive reaction, the tuberculo-complement fixation reaction and the estimation of the degree of sensitiveness; the repetition of these tests and if necessary the additional use of the general and focal reaction to tuberculin.

In regard to the interpretation of results, the presence of a marked inhibitive together with a slight or doubtful complement fixation test is an absolute indication that the person has the disease. With a marked inhibitive reaction alone, the diagnosis is doubtful. With a positive complement fixation test alone, the degree of the reaction is important,—the stronger the reaction the more certain the diagnosis. In either of the above cases the tests should be repeated. Any marked variation in the degree of tuberculin sensitiveness should be considered as suggestive of tuberculous disease rather than infection. If the repetition of the tests are still "doubtful" the data should be regarded as of exclusive value especially after a number of tests over a period of time.—T. G. H.

2530. The Adrenals and Thyroid in Experimental Tuberculosis. G. B. Webb, G. B. Gilbert and C. T. Ryder. Am. Rev. Tuberc., Balt., 1921, **5**, 266–270.

The adrenals become enlarged in guinea pigs in the course of generalised tuberculosis, and also in pyogenic infections.

The thyroid gland also appears to enlarge in experimental tuberculosis of guinea pigs, as well as in certain forms of human tuberculosis.

This enlargement of adrenals and thyroid is probably in response to a demand for increased function, and it may be desirable to supplement this tendency by giving adrenal and thyroid extracts in selected cases of human tuberculosis.—T. G. H.

2531. Tuberculosis: The Rationale of Research. Gerald B. Webb. Am. Rev. Tuberc., Balt., 1921, **5**, 271-277.

In this presidential address Dr. Webb lists ten items that we know definitely concerning tuberculosis, and seventeen items on which our knowledge is hazy or lacking. The address is a plea for alertness in observation and for enthusiasm in research.—T. G. H.

2532. Tuberculous Empyema. George B. Kalb. Am. Rev. Tuberc., Balt., 1921, **5**, 339–344.

The author describes the formaldehyde-glycerin treatment of Murphy and gives two case reports in which it was successful.—T. G. H.

2533. The Campaign Against Tuberculosis. James M. Anders. Am. Rev. Tuberc., Balt., 1921, **5**, 345–350.

The author suggests the fight against tuberculosis be based first, on the building of a maximum resistance in the patient and second, on education of the public with regard to the nature and prevention of the spread of tubercle bacilli.—T. G. H.

2534. Are Eating Utensils Carriers of Tubercle Bacilli? H. Longstreet Taylor. Am. Rev. Tuberc., Balt., 1921, **5**, 351–355.

The wash water from spoons used by "open" cases of tuberculosis was injected intraperitoneally into guinea pigs. Out of 14 pigs so injected 4 died of tuberculosis. The same spoons, after the above washings, were scrubbed and washed in order to see if any tubercle bacilli were left on them. These second washings, when injected into 16 guinea pigs, caused tuberculosis in no instance. The conclusion is that the dish washing in the St. Paul City and County Hospital is efficient in removing tubercle bacilli from the dishes.—T. G. H.

2535. Hypertrophic Osteoarthropathy in Pulmonary Tuberculosis. H. J. Corper, Phillip Cosman, William M. Gilmore and Louisa T. Black. Am. Rev. Tuberc., Balt., 1921, **5**, 357–387.

Hypertrophic osteoarthropathy is a common secondary pathological condition in consumptives, manifesting itself as a hypertrophy of the soft tissues and bony structures of the body, with certain sites of predilection. It is probable that there are still many sites in the body which have thus far escaped attention.

The most common sites of the osseous manifestations of this associated pathological alteration in tuberculosis are the distal and proximal phalanges of both the hands and feet, the long bones of the arms and legs (Locke and Kessel), and the bony processes (jaws and hard palate) of the oral cavity.

The most common sites of the soft tissue manifestations are the tips of the distal phalanges of both the hands and feet and possibly to a certain extent the nose and malar processes (Kessel).

The toe nails and finger nails are also a common site of the manifestations of hypertrophic osteoarthropathy, the expressions of this condition of the nail being an increased convexity of the anterior posterior curvature—"the hyperconvex nail"—a lateral broadening, and increased ridging both lateral and transverse.

Hyperconvex nails of the hands and feet of consumptives occurred to the extent of about 75 to 95 per cent in the series studied, there being no difference in the incidence dependent upon the activity of the disease or the sex of the case.

Hypertrophy of the soft tissues of the hands and feet of consumptives has a higher incidence in the active (about 65 to 80 per cent) than in the inactive cases (about 45 per cent).

Bone changes of the hands and feet of consumptives were greater in the active (about 50 per cent) than in the inactive cases (about 20 per cent).

A tumor-like hypertrophy of the hard palate was found in consumptives, apparently a manifestation of hypertrophic osteoarthropathy, which like the other manifestations of this condition had a greater incidence in the active cases (about 45 per cent in males).

No significant differences in the incidence of the manifestations of hypertrophic osteroarthropathy in cases of pulmonary tuberculosis were noted, whether the pulmonary condition had been of short (one year) or longer duration (over 3 years).

A complete study is essential to the diagnosis of hypertrophic osteoarthropthy in consumptives, because of the varied manifestations of this condition and the simulation of the individual symptoms by other conditions, both mechanical and occupational.

A roentgenological study for bone changes in the absence of external findings is essential to the making of a diagnosis of hypertrophic osteoarthropathy, as was pointed out by Kessel. —T. G. H.

2536. *The Survival and Virulence of Tubercle Bacilli In Excised Animal Lymph Nodes.* G. B. Webb, C. T. Ryder and G. B. Gilbert. Am. Rev. Tuberc., Balt., 1921, **5**, 388–396.

Tubercle bacilli, enclosed in tuberculous tissue and kept in salt solution at body temperature, lose their virulence and probably die in a few days, regardless of whether contamination occurs or not.

Tubercle bacilli free in salt solution, or on the surfaces of crushed tissue, die in a short time when in close contact with certain types of putrefaction, but survive for a long time in the absence of putrefaction.—T. G. H.

2537. *Reinfection in Tuberculosis. Experimental Arrested Tuberculosis and Subsequent Infections.* Edward R. Baldwin and Leroy V. Gardner. Am. Rev. Tuberc., Balt., 1921, **5**, 429–517.

This extensive article, with nearly two hundred references, reviews all previous work on the subject of experimental reinfection. The authors' own work consists in infecting guinea pigs by inhalation with the Trudeau strain (Rl, of low virulence), followed a year later with another inhalation of a highly virulent dried culture; a slower and less extensive course of the disease was noted in the infected animals than in the controls. A strong primary infection, followed 18 months later by reinfection with the same culture, failed perceptibly to increase the amount of disease in the lungs and glands. Three successive infections with Rl (at intervals of 8 months and 5 months) produced definite pulmonary and lymphatic tuberculosis with evidence of fibrosis; the lesions were not as numerous as those in the control animals which received single infections at time of second and third inoculations. Animals receiving a primary inoculation followed 18 months later by granite dust inhalation showed healed lesions to be more prominent than in the controls, but the dust had not spread the disease. Reinfection with Rl culture after 2 years of arrested disease was apparently well resisted. The long interval is considered as satisfactory proof of healed infection.

The tuberculin intradermic test when given in doses of 0.005 to 0.02 cc. can be expected to give some reaction in both animals and humans, however slight the tuberculous infection may have been; this is not invariably true however.

The second part of the paper is given up to a discussion of reinfection in its clinical and epidemiological aspects. The earliest exogenous reinfections are probably well resisted, and good physiological functions combined with such immunity tend to ward off further infection after adult age is reached. Massive infections by inhalation are unlikely. The infection is probably cumulative during childhood and youth, and those persons developing the disease after twenty years of age have already acquired it during youth. It is impossible to associate many cases of clinical tuberculosis in adults with recent exogenous sources of infection, or to set the date of exposure.—T. G. H.

2538. *Some Causative Factors of Pulmonary Tuberculosis.* Lawrason Brown. Am. Rev. Tuberc., Balt., 1921, **5**, 518–546.

While 8 to 10 per cent of all tuberculosis deaths in children are caused by infection from the bovine tubercle bacillus, this organism cannot be considered a factor in adult tuberculosis. The human tubercle bacillus is responsible therefore. Dust of itself is not dangerous, but if it bears human tubercle bacilli it may be so. Droplet infection may be limited to those droplets inhaled before settling upon any object and probably is much more dangerous for children than adults. The danger from contact is greatest; tubercle bacilli have been found on eating utensils, on objects kissed, in particles of sputum coughed out, on the dust of floors where patients have spat and in sewage. Gross contamination of the hands may take place through wiping the lips or soiling with sputum. While virulence of the tubercle bacillus has been dwelt upon, the resistance of the host is more important. Massiveness of infection is also important.

Nearly all children are susceptible to tuberculous infection. Constant slight reinfection tends to produce some immunity.

Bovine tuberculosis causes 25 per cent of the cases up to puberty, but then on ceases to be of importance. Ten per cent of the deaths from tuberculosis among children are caused by the bovine tubercle bacillus.

Heredity is an important factor. The inheritance of certain physical peculiarities, leading to increased resistance on the one hand, and decreased on the other, must be regarded. Race in some instances is of importance,—the savage races especially being less resistant.

Superimposed infection, autogenous reinfection and exogenous reinfection all enter in to increase the number of deaths. Disease and injury to various organs give the tubercle bacillus a foothold where its presence would not have been suspected before.—T. G. H.

2539. *The Protection of Mankind Against Tuberculosis.* A. CALMETTE. Internat. J. Pub. Health, Geneva, 1920, **1**, 3.

The widespread distribution of the tubercle bacillus among civilized peoples should lead to the careful assembling and use of all the facts relating to the disease. After a short discussion of the types of infection the question of active vaccination is raised. It was planned in 1913 to carry on experiments along this line among anthropoid apes. The cost of the war has forced the experiment to be stopped for want of funds and the author suggests a joint fund of the leading nations be used to carry on the work.—P. D. M.

2540. *Early Treatment and Protective Inoculation in Tuberculosis.* K. SHIGA. Internat. J. Pub. Health, Geneva, 1921, **2**, 34.

Shiga uses protective inoculation on the following: (1) Those who have been exposed to infection within their family circle; (2) those of consumptive appearance, as, for example, the anemic and the debilitated, those of weakly constitution; (3) those with chronic tonsillitis or cervical adenitis (scrofula); (4) those who easily catch colds and have a continuous slight fever; (5) those who from time to time suffer from fever of uncertain origin or whose temperature rises slightly after moderate exercise; (6) those in whom, on auscultation, are found rough or diminished breath sounds.

Protective inoculation should be undertaken during school age. Pirquet's reaction is a necessary preliminary showing whether or not there is tuberculous infection together with degree of intensity. The author gives a table showing content of his serovaccine for the different inoculations. He believes the results obtained over a period of 4 years are distinctly encouraging.—P. D. M.

2541. *Tuberculosis in Primitive Tribes and its Bearing on the Tuberculosis of Civilized Communities.* S. L. CUMMINS. Internat. J. Pub. Health, Geneva, 1920, **1**, 137.

The author concludes that "members of isolated communities, where tuberculous disease is rare or absent, show, in comparison with members of infected areas, a marked susceptibility to the disease." In infected communities the relatively high resistance to infection with the tubercle bacillus may be attributed to acquired immunity due to previous contact with the disease. Lack of such contact explains the susceptibility of African and other primitive races. Mild infections with the bovine type may be a factor in raising the general resistance to the human type. This increased resistance in parents, producing chronic conditions, may be a source of increased danger to children.—P. D. M.

DISEASES OF CHILDREN

(See also Numbers 2381, 2391, 2571, 2587, 2602, 2605)

2542. *Der Wert der Döhleschen Leukozyteneinschlüsse und des Schulz-Charltonschen Auslöschphänomens für die Diagnose des Scharlachs. (The Value of the Döhle Leucocytic Inclusions and of the Schulz-Charlton Extinction Phenomenon in the Diagnosis of Scarlet Fever.)* EDGAR WÖHLISCH AND FELIX V. MIKULICZ-RADECKI. Berl. klin. Wchnschr., 1921, **58**, 389–392.

The Döhle leucocytic inclusions are demonstrable by suitable staining, and seem to occur in proportion to the severity of scarlet fever. The Schulz-Charlton phenomen consists in a permanent blanching of the erythema at the site of injection of normal or convalescent serum into a scarlet fever patient. Both phenomena are important aids in the differential diagnosis of the disease as is shown by the examples cited. Doubtful cases are differentiated with comparative ease. These tests may, however, fail when the disease runs a very mild course and erythema is almost absent.—B. C.

2543. *Ueber chronische Diphtheritis und Lues. (Chronic Diphtheria and Syphilis.)* U. FRIEDEMANN. Berl. klin. Wchnschr., 1921, **58**, 376–378.

In spite of serum treatment certain cases of diphtheria continued a chronic course for months. The membrane-formation and bacteriological findings were typical. The Wassermann reaction was positive in these cases, and salvarsan injections were followed in a few days by complete disappearance of the diphtheria.—B. C.

GYNECOLOGY AND OBSTETRICS

2544. Essais de thérapeutique gynécologique basés sur la choc anaphylactique. (Anaphylactic Shock in the Therapy of Gynecologic Conditions.) G. BOUCHÉ AND A. HUSTIN. Rev. mensuelle gynécol. et obstét., 1921, **4**, 13–47.

The effect of anaphylactic shock upon the development or persistence of a number of gynecologic conditions was determined. In cases of amenorrhea sensitization of the patient with horse serum (subcutaneously) was followed after an incubation period of 15 days by the intrauterine administration of horse serum. Immediate shock was never obtained, but after a latent period of from a few hours to 3 or 4 days a reaction took place, in which the most prominent feature was uterine hemorrhage. The period of bleeding varied from 12 hours to 6 days, the duration apparently being definitely related to the time of the shock with reference to the normal menstrual period. In such "artificially" produced menstruation the symptoms induced corresponded in many respects to those accompanying spontaneous menstruation. From these similarities, as well as from blood coagulation changes, etc., the idea is advanced that normal menstruation is simply an anaphylactic reaction. Metrorrhagia was also treated by horse serum shock, but in this condition both the sensitizing and intoxicating injections were given subcutaneously. The sensitizing injection did not appear to be of any benefit in the condition but the toxic injection often had a marked effect in diminishing the bleeding. The effect was proportional to the degree of local reaction induced by the injection. Irregular menstruation may be corrected and regulated in some degree by repeated serum shocks. The shocks did not affect normal menstruation, did not interrupt pregnancy, or cause any serious reactions.—G. H. S.

2545. Zur Hebung der Asepsis in der Neugeborenen- und Wöchnerinnenpflege. (The Improvement of Asepsis in Obstetric Practice.) HANS KRITZLER. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 420.

It is recommended that the midwife be made to wear muslin gloves which are dipped into bichloride just before use. There is ordinarily no danger involved in omitting bathing of the newborn until the umbilical cord has dried up; and the advantage from such omission lies in maintaining the umbilical bandage in an undisturbed position and thus preventing infection. —B. C.

DERMATOLOGY

(*See also Numbers 2449, 2551, 2579, 2582*)

2546. Pellagra. JOHN L. JELKS. South. M. J., Birmingham, 1921, **14**, 678–681.

The author believes that pellagra is due to some parasite whose habitat is the intestine. He proposes a technic which he believes very valuable in diagnosis of this condition.

"From a capillary pipette, 1/16 inch in diameter, place one drop of a saturated alcoholic solution of gentian violet in 6 cc. of a solution (fecal emulsion) consisting of ¼ cc. of suspected feces plus 2 cc. of broth, brought up to 6 cc. by adding 4 cc. of distilled water. With a cork stopper in tube, invert end for end a few times, and incubate at 37°C. shaking contents about 3 times daily.

"If decolorization occurs within 6 to 24 hours or up to 48 hours, it is considered a positive reaction and denotes a parasitic infection, whether or not parasites have been found previously by either warm fresh stool examination or stained specimens, or both. If decolorization does not occur it is considered a negative reaction."—J. H. B.

2547. Beitrag zur Kasuistik des Bromoderma. (A Case of Bromoderma.) ERNST KLEBELSBERG. Wien. klin. Wchnschr., 1920, **33**, 582–583.

Two cases of bromism are described in which an acne-like eruption was a prominent symptom. The exact origin of the acne is apparently still a disputed question.—B. C.

2548. Psoriasis. G. UNNA. Wien. klin. Wchnschr., 1921, **34**, 275–277.

The clinic and pathology of the disease are discussed.—B. C.

ORAL BACTERIOLOGY

2549. Origine des spirochètes des régions buccale et trachéo-bronchique. (Origin of the Spirochetes of the Buccal and Tracheo-bronchial Regions.) H. VIOLLE. Compt. rend. Soc. de biol., Par., 1921, **85**, 695–696.

The spirochetes found in the mouth, in association with pyorrhea, Vincent's angina, or Castellani's disease, are almost invariably present in adults. They are not, however, to be found in infants. Apparently water or milk can not be the agency of introduction. Spirochetes are abundant in soil, particularly those soils which are moist, rich in organic matter and of a neutral or slightly alkaline reaction. Most probably they gain access to the mouth by way of particles of dirt upon fruits and vegetables.—G. H. S.

2550. Ueber den zunehmenden Phagedänismus. (*The Increasing Occurrence of Gangrenous Ulcerations.*) A. Buschke. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 358.

Plaut's observations are confirmed. There is an increased occurrence of these affections in Berlin also. The fuso-spirillary organisms were always present. They are however, not to be held primarily responsible, for it is believed that some invisible, unknown virus must be the cause. As with ulcus molle, no autoinfection occurs in these cases.—B. C.

FILTERABLE VIRUSES

(*See also Number 2442*)

2551. Zur Aetiologie des Herpes febrilis. (*The Etiology of Herpes Febrilis.*) A. Luger and E. Lauda. Wien. klin. Wchnschr., 1921, **34**, 251–252.

In 25 cases of febrile herpes occurring in various diseases, the vesicular contents were carefully examined microscopically. Regular examinations were also made of conjunctival and corneal smears from rabbits and guinea pigs experimentally infected with corneal febrile herpes. In the majority of cases the results were negative, only rarely showing presence of staphylococci or streptococci. It is believed that a filterable virus is involved in this disease. —B. C.

SEROLOGY

(*See also Numbers 2373, 2506, 2529*)

2552. Zur Theorie der Serologie der Syphilis. (*The Theory of the Serology of Syphilis.*) Emil Epstein and Fritz Paul. Wien. klin. Wchnschr., 1921, **34**, 254–255.

Specific precipitates in saline media are different from those in watery solution in that the former consist of lipoids while the latter consist of proteins and lipoids. The Meinicke reaction therefore cannot be explained as being simply a globulin precipitation. The lipoids in the Meinicke extract possess a negative charge and they are precipitated by positively charged substances. The Wassermann reaction also is essentially due to this physical precipitation, only that the hemolytic system is used as an indicator which utilizes complement. Wassermann's recent hypothesis finds no support in these observations.—B. C.

2553. Entgegnung auf A. v. Wassermann's modifizierte Lipoidhypothese. (*Objection to A. v. Wassermann's Modified Lipoid Hypothesis.*) Carl Lange. Berl. klin. Wchnschr., 1921, **58**, 330–331.

So far as Wassermann's meager experimental details permit a conclusion, it seems that the specific syphilitic serum constituent termed by him 'Wassermann substance' is the 'Lues-reagin' described years ago. Wassermann also tacitly assumes that the lipoid extract acts as an antigen. If this is so, then colloidal gold and mastic which act like the lipoid extract should also be termed antigens. The evidence and deductions presented by Wassermann are not conclusive.—B. C.

2554. Ueber die Antikörpernatur der Wassermannsubstanz. (*The Antibody Nature of the Wassermann Substance.*) August v. Wassermann. Berl. klin. Wchnschr., 1921, **58**, 331–334.

A reply to Lange (see abstract No. 2553). The lipoid antigen which is a cell product answers *completely* the definition of an antigen. Colloidal gold and mastic do not. It is true that the latter may assume a physical state which will adsorb specific substances from the spinal fluid and give a characteristic precipitate but this fact is no contradiction of the antigen-antibody relation between lipoidal extract and the Wassermann substance.—B. C.

2555. Zur Kenntnis der Wassermann-Reaktion bei Tumoren des Zentralnervensystems. (*Wassermann Reaction in Cases of Tumor of the Central Nervous System.*) F. Lotmar. Schweiz. med. Wchnschr., 1921, No. 44, 1013–1016.

A case is reported of tumor of the central nervous system (xanthofibrosarcoma) in which the spinal fluid Wassermann was positive. The blood Wassermann was negative. The abnormal lipoid metabolism in such tumors, or abundant fat content, is suggested as being of possible significance in the serologic reactions of the spinal fluid.—G. H. S.

2556. Ueber neue Körper mit bisher unbekannter Wirkung im menschlichen Serum. (*Substances in Human Serum with Hitherto Unknown Effect.*) M. Mandelbaum. München. med. Wchnschr., 1920, **67**, 1229–1232.

The new bodies, designated "cytophilins," occur in human blood combined with "endglobulin," and are set free by incubation of the globulin solution at 37°C. They have a marked affinity for red cells, regardless of the source, whether of homologous or heterologous individuals, families or species. Cells charged with cytophilins destroy the complementary effect of added fresh guinea pig serum; and they are discharged by active or inactive human serum. Cytophilins are perhaps a preliminary stage of the amboceptors. They are colloids and their activity is damaged by heating to 56°C.—B. C.

2557. Die Rolle der Albumine und Globuline bei der Wassermannschen Reaktion. (*The Rôle of Albumins and Globulins in the Wassermann Reaction.*) H. Felke. München. med. Wchnschr., 1920, **67**, 1291–1292.

European contributions to the subject are discussed. Felke found that removal of globulins from positive sera left the latter fully reactive toward specific luetic tests.—B. C.

2558. Zur Konservierung des Komplements. (*The Preservation of Complement.*) JOHANN HAMMERSCHMIDT. München. med. Wchnschr., 1920, **67**, 1382.

Rhamy's observation is confirmed that a 10 per cent solution of sodium acetate in physiological saline when mixed with fresh guinea pig serum in the proportion of 6 to 4 preserves complement perfectly for at least 10 days.—B. C.

2559. Sur la photolabilité du complément. (*The Photolability of Complement.*) E.-G. LUNDBERG. Compt. rend. Soc. de biol., Par., 1921, **85**, 758.

In the attenuation of complement (swine) by light, as in attenuation due to heat, the reaction is of the monomolecular type. The rapidity of the attenuation is proportional to the intensity of the illumination.—G. H. S.

2560. A Rational Method of Producing Antihuman Amboceptor in Rabbits. GEORGE F. KLUGH. South. M. J., Birmingham, 1921, **14**, 684–685.

The author found that rabbits can stand with impunity any reasonable amount of cells given intravenously or intraperitoneally and any number of injections during the first 10 days or 2 weeks following the first injection, i.e., until they become sensitized. However, during this time no amboceptor is produced.

The method consists of the injection into the marginal ear vein of 1 cc. of packed cells; second injection on seventh day, 1 cc. packed cells; third, fourteenth day, 0.5 cc.; fourth, twenty-first day, 0.5 cc. The last injection is usually unnecessary. The second dose seems unnecessary but no time is lost in giving it. Little amboceptor is produced until 4 days after the third dose, being greatest about 7 days after this dose.—J. H. B.

2561. The Reactivation of the Natural Hemolytic Antibody in Chicken Serum. R. R. HYDE. Am. J. Hyg., 1921, **1**, 358.

The natural hemolysins of chicken serum for rabbit corpuscles can be reactivated with fresh chicken serum and also with guinea pig serum after inactivation by heat. The technique consists in mixing and incubating the inactive serum and complement before the corpuscles are added.—P. D. M.

2562. Om Sachs-Georgis syfilisreaktion. (*On the Reaction of Sachs-Georgi in Syphilis.*) E. MURSTAD. Med. Rev., Bergen, Norway, 1921, **38**, 74.

As a result of much experience the author concludes that the reading of the reaction is somewhat more difficult than in the case of the Wassermann reaction. In diseases other than lues positive reactions may be seen, though seldom. The Sachs-Georgi test cannot as yet take the place of the Wassermann reaction but it is a valuable supplement to it.—T. T.

2563. Beitrag zur Sachs-Georgi Reaktion. (*Contribution to the Sachs-Georgi Reaction.*) RUDOLF SOMOGYI. München. med. Wchnschr., 1920, **67**, 1233.

The surface tension of the Sachs-Georgi system changes during the course of the reaction. The surface tension varies in the same direction for positive and negative sera, but very greatly for negative sera. In the conduct of the test, the results could be designated numerically in terms of surface tension data.—B. C.

2564. Ueber eine kombinierte Sachs-Georgi-Wassermannsche Reaktion. (*A Combined Sachs-Georgi-Wassermann Reaction.*) EGON KEINING. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 330–331.

Keining claims priority over Kafka on the application of this combined test. Sometimes, the Wassermann reaction fails in spite of specific flocculation, and vice versa. An absorbent effect of the flock upon the complement components of active sera cannot be present in the light of the above fact.—B. C.

2565. Die Luesreaktionen von Meinicke und Sachs-Georgi in der inneren Medizin. (*The Syphilis Reactions of Meinicke and Sachs-Georgi in Internal Medicine.*) KARL HAJÓS AND BÉLA MOLNÁR, JR. Wien. klin. Wchnschr., 1920, **33**, 966–969.

These reactions are simpler than the Wassermann reaction, but their sensitiveness is somewhat lower. The Meinicke reaction is less specific than the Wassermann, but the Sachs-Georgi has a specificity approaching the latter. The Sachs-Georgi reaction is applicable to the examination of spinal fluids, while the Meinicke is not. Neither of these may yet replace the Wassermann reaction, but the Sachs-Georgi is very helpful when the Wassermann fails. —B. C.

2566. Ueber den serologischen Luesnachweis mittels der Ausflockungsreaktionen nach Meinicke und Sachs-Georgi. (*The Serologic Test for Syphilis by means of the Flocculation Reactions of Meinicke and Sachs-Georgi.*) KARL PESCH. München. med. Wchnschr., 1920, **67**, 1232–1233.

The flocculation reactions are valuable, but because they sometimes respond non-specifically, it is not yet safe to supplant the more tedious Wassermann reaction with them.—B. C.

2567. The Value and Mechanism of the Colloidal Gold Test. John Cruickshank. Brit. J. Exper. Path., Lond., 1920, 1, 71–88.

A review of the literature is given, with an explanation of the principles underlying the test, and a description of methods for preparing the colloidal gold. A chart shows the typical paretic, luetic, and meningitic zones of reaction. An extensive bibliography is appended.

The colloidal gold test was studied in 90 cases of mental disorders. In general paralysis the results of this test coincided with those given by the Wassermann reaction. There is a considerable degree of probability that in those cases in which the colloidal gold is positive with a negative Wassermann the gold test is the more delicate indication.

As the reacting power of a syphilitic serum or spinal fluid has been shown to reside in the globulin fraction of the protein, a precipitate of globulin was prepared from a positive fluid. The globulin had a precipitating power more active than the original spinal fluid. Only slight diminution of the precipitating power followed prolonged dialysis of the globulin solutions, and no precipitating substance was found in the dialysate. It was found that the addition of appropriate amounts of the albumen fraction to the globulin interfered with the precipitation of gold and caused anomalous results of the luetic type to appear. Comparatively small amounts of human or animal serum albumen exerted protective action, and it was possible by adjustment of the amount to render completely negative the action of the globulin on colloidal gold.

Globulin from fluids which gave negative results with the gold test, in concentration 100 times that of the original fluid showed only slight precipitation of gold colloid. These experiments suggested that the reactions of paretic fluids were not due solely to the increased content of globulin, but to an alteration in the physical or chemical character of the globulin, which is associated with an increased positive electric charge. Although human serum globulin also possesses the characters of a positive colloid, the paretic and luetic reactions of spinal fluids cannot be attributed to the passage of serum globulin into the spinal fluid. The meningitic reactions, on the other hand, may be due to leakage of plasma through meninges damaged by inflammatory change.

The impression has been formed that for the present only the reactions of the paretic and luetic types should be regarded as of real diagnostic value, and that the meningitic reactions, while being of some value in conjunction with other findings, are less reliable.—A. C. E.

2568. Réactions colloidales du liquide céphalorachidien. (*Colloidal Reactions in the Spinal Fluid.*) A. Sordelli and E. Rennella. Compt. rend. Soc. de biol., Par., 1921, 85, 687–689.

Comparison of the Lange reaction and the colloidal benzoin and mastic reactions upon 130 spinal fluids indicates that the Lange test is the most sensitive and quite generally agrees with the Wassermann reaction. The benzoin reaction is to be preferred to the mastic test. —G. H. S.

2569. Les réactions du benjoin et du mastic dans le liquide céphalorachidien. (*Benzoin and Mastic Reactions on the Spinal Fluid.*) S. Mazza, C. Mey and F. Nino. Compt. rend. Soc. de biol., Par., 1921, 85, 686–687.

The benzoin and mastic tests were correlated with the Wassermann reaction on 80 specimens of spinal fluid. The tabulated results show the extent of agreement among the reactions.

	NUMBER OF CASES	WASSERMANN	BENZOIN	MASTIC
General paresis	21	+	+	+
	2	+	−	−
	1	+	−	+
Tabes	9	+	+	+
	1	+	−	−
	3	−	−	−
Tabo-paralysis	1	−	+	+
Cerebrospinal syphilis	3	+	+	+
	3	−	−	−
	1	+	−	+
	1	−	+	+
Secondary syphilis without C. N. S. involvement	21	−	−	−
	1	+	−	−
	2	+	−	+
Control cases	7	−	−	−
	1	+	−	+
	2	−	+	+

—G. H. S.

2570. *Valeur comparée de la réaction du benjoin colloidal.* (*Comparative Value of the Colloidal Benzoin Reaction.*) H. Rabeau. Compt. rend. Soc. de biol., Par., 1921, **85**, 704–706.

Results with 200 spinal fluids are reported. The tests almost always agreed with the Wassermann reaction. The reaction proved highly specific for syphilitic infection and is considered more trustworthy than the colloidal gold test or the Sachs-Georgi reaction.—G. H.S.

2571. *La réaction du benjoin colloïdal dans les méningites des maladies infectieuses: rubéole et oreillons.* (*The Colloidal Benzoin Reaction in the Meningitis of Infectious Diseases; Measles and Mumps.*) René Benard. Compt. rend. Soc. de biol., Par., 1921, **85**, 712–713.

The colloidal benzoin reaction was negative in cases of measles and mumps which clinically presented evidence of meningeal involvement.—G. H. S.

2572. *Sur la technique de la réaction du benjoin colloïdal.* (*Technic of the Colloidal Benzoin Reaction.*) Georges Guillain, Guy Laroche and P. Lechelle. Compt. rend. Soc. de biol., Par., 1921, **85**, 776.

The authors affirm that the modification of their technic suggested by Sordelli and Renella (Compt. rend. Soc. de biol., Par., 1921, **85**, 687) detracts from the sensitivity of the reaction.—G. H. S.

SERUM THERAPY

(*See also Numbers 2378, 2594*)

2573. *Antipneumococcus Protective Substances in Normal Chicken Serum.* C. G. Bull and C. M. McKee. Am. J. Hyg., 1921, **1**, 284.

Normal chicken serum protects mice and guinea pigs against infection with pneumococci. The protective elements are found in the water soluble portion of the serum globulin. These protective substances are severally specific for each serological type of pneumococcus and can be selectively removed by bacterial adsorption with the desired type. Types IIA and IIB constitute two distinct main groups and Type II strains form a subgroup to the first two when studied in relation to the protective substances in chicken serum.—P. D. M.

2574. *Sérum contre le chancre mou, spécialement contre les bubous chancreaux.* (*Serum against Soft Chancre, Particularly against Chancrous Bubos.*) J. Reenstierna. Compt. rend. Soc. de biol., Par., 1921, **85**, 830–832.

The preparation and use of an antiserum (B. of Ducrey) for therapeutic purposes is recorded. The results reported indicate that the serum is to some degree effective.—G. H. S.

2575. *Proportions de neutralization des venins par les sérums antivenimeux.* (*Proportions of Neutralization of Venin with Antivenin.*) B. A. Houssay and J. Negrete. Compt. rend. Soc. de biol., Par., 1921, **85**, 999–1001.

The quantitative relationships existing in the neutralization of venin with antivenin indicate that the reactions are of the nature of colloidal phenomena.—G. H. S.

HYPERSENSITIVENESS—ANAPHYLAXIS, ALLERGY

(*See also Numbers 2425, 2544*)

2576. *Action du sérum antiplaquettique sur l'anaphylaxie sérique.* (*Effect of Antiplatelet Serum on Serum Anaphylaxis.*) Edgard Zunz and Paul Govaerts. Compt. rend. Soc. de biol., Par., 1921, **85**, 664–666.

Guinea pigs sensitized to horse serum received, just before the intravenous intoxicating injection, an intraperitoneal injection of 0.8 to 1 cc. of antiplatelet serum. The tabulated results show that the M. L. D. of homologous serum is increased for the antiplatelet serum treated pigs, and that with a given dose of serum the treated pigs show a much less profound shock. The intraperitoneal injection of a normal rabbit serum will also offer some protection against an intoxicating injection.

Attenuation of the shock by antiplatelet serum in serum anaphylaxis is not, however, as marked as in anaphylatoxin intoxications (serum adsorbed with agar). Normal rabbit serum offers no protection against shock due to anaphylatoxin.—G. H. S.

2577. *Choc passif chez le cobaye par injection intracardiaque de sérum d'intolérants et d'arsénobenzène.* (*Shock Induced in Guinea Pigs by Injection of Arsenobenzol after the Injection of Serum from Persons Intolerant to Arsenobenzol.*) A. Tzanck. Compt. rend. Soc. de biol., Par., 1921, **85**, 839.

A reaction characterized by anaphylactic symptoms was produced in guinea pigs by the intracardial injection of arsenobenzol and the serum from patients who were intolerant to this drug. The injection of only one of the ingedients failed to elicit a reaction, as did the injection of the drug when mixed with the serum of tolerant persons.—G. H. S.

2578. Anaphylaxie active aux arsénobenzènes chez le cobaye. (Active Anaphylaxis to Arsenobenzol in the Guinea Pig.) Ch. Flandin and A. Tzanck. Compt. rend. Soc. de biol., Par., 1921, **85**, 993–994.

Intracardial injections of arsenobenzol, spaced at intervals of 3 days, gave reactions in guinea pigs which simulated anaphylactic shock.—G. H. S.

VACCINE PROPHYLAXIS AND THERAPY

(See also Numbers 2420, 2539, 2540)

2579. Conscientious Objection. Editorial. Pub. Health, Lond., 1921, **34**, No. 12, 223–224.

A discussion of the consequences of laxity in smallpox vaccination, illustrated by the present condition in Nottingham, where 36 out of the 46 cases of smallpox were in unvaccinated people, and the majority of the other 10 cases were those vaccinated too long ago for immunity. Reference is also made to the 1920 Glasgow epidemic, where "conscientious objectors" had greatly increased from 407 in 1907 to 7580 in 1914, and where in recent years the successful vaccinations had decreased from 84 per cent (1902) to 54 per cent (1918). In the Glasgow outbreak there were 578 cases and 125 deaths; the mortality among the unvaccinated being 36.7 per cent, and among the vaccinated 16.1 per cent.—J. B.

2580. Small Pox Vaccination and Pulmonary Tuberculosis. Walter C. Klotz and Frank B. Stafford. Am. Rev. Tuberc., Balt., 1921, **5**, 595–598.

At the Blue Ridge Sanatorium 93 tuberculous patients were vaccinated against smallpox. Vaccinia was as severe in the early cases as in the far advanced cases. Moderately advanced cases showed severe vaccinia in approximately half the cases. Apparently the stage of tuberculosis does not determine any difference in the severity of vaccination. The conclusion is that smallpox vaccination is not contraindicated in tuberculosis.—T. G. H.

2581. Ueber einen Fall von Wundinfektion mit Vaccinevirus. (Wound Infection with Vaccine Virus.) C. Schneiter. Schweiz. med. Wchnschr., 1921, No. 46, 1071–1072.

The title indicates the nature of the case reported.—G. H. S.

2582. Ueber die Schutzpockenimpfung bei Schwangeren. (Smallpox Vaccination in Pregnancy.) F. Kirstein. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 328–330.

Infants from mothers vaccinated or revaccinated with cowpox do not possess an immunity to the latter. A uniform and reliable vaccination technic is essential. Infants born at full term may be vaccinated on the first or second day post partum with entire safety; but premature infants are apparently not strong enough for such treatment.—B. C.

2583. Sur la vaccination de l'homme contre la dysenterie bacillaire. (Vaccination against Bacillary Dysentery in Man.) H. Vincent. Compt. rend. Soc. de biol., Par., 1921, **85**, 965–967.

Several series of vaccinations are reported indicating the efficacy of antidysentery vaccination in man. A polyvalent vaccine was administered in small doses to 2175 individuals. Antibodies to the vaccine first appeared in 5 to 6 days after the injection. This is to be correlated with the fact that 33 cases of dysentery developed among the vaccinated during the first 4 days after the treatment. In the vaccinated the morbidity was 1.6 per cent as compared with 22.8 per cent in the unvaccinated. Another series showed among the nonvaccinated 70.57 cases per 1000 with 1.56 deaths; among the vaccinated 8.14 cases per 1000 with no deaths. The vaccine was composed of the following types: Shiga, 8 strains; Flexner, 5 strains; Strong, 1 strain; and Hiss, 3 strains.—G. H. S.

2584. Vaccines in the Treatment of Tuberculosis. Arnold Minnig. Am. Rev. Tuberc., Balt., 1921, **5**, 421–428.

Autogenous vaccines are indicated in a certain proportion of cases of pulmonary tuberculosis. In a series of 63 cases, 32, or 52 per cent, improved, and 15 of these were stage III cases.

More than one organism to a vaccine is contraindicated in most cases. Stock vaccines are useless.

The organism which gave the best results in the above series of cases was the *Streptococcus hemolyticus*.

Vaccines are contraindicated when there is present some evident focus of infection outside the lung. Here the course indicated is to remove the other focus and after a month or two start vaccine therapy.

The vaccine treatment is not suitable when there is coexisting acute infection, an acute exacerbation of tuberculosis or persistently high temperature.—T. G. H.

2585. Der heutige Stand der Lehre von der Vakzination. (The Present Status of Vaccination Knowledge.) Hans Reiter. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 333–335.

General infections do not usually yield to vaccine treatment. Bacterial diseases producing focal processes are to be treated while these processes are carefully watched. Small focal reactions are desirable, and larger ones are to be avoided. The vaccination should begin with small doses, and only after focal reactions cease should the dosage be increased by trial.

Injections should usually be made subcutaneously or intramuscularly in the gluteal region (not in the extremities) under careful asepsis. Treatment should be omitted during menstruation and intercurrent disease. Autogenous vaccines should be tried when the commercial polyvalent kind is unsuccessful. Under circumstances, a trial vaccination may confirm a doubtful diagnosis by causing the appearance of a focal reaction.

Specific vaccine therapy is recommended in: (a) furunculosis, mastitis, osteomyelitis, abscesses and other localized staphylomycoses; (b) erysipelas, panaritium and localized streptomycoses; (c) gonorrheal epididymitis, arthritis, prostatitis, abscesses and other localized gonococcal infections; (d) other localized diseases due to *Bact. coli*, pneumococci, *B. pyocyaneus*, etc.—B. C.

NONSPECIFIC THERAPY

2586. The Focal Reaction. William F. Peterson. Am. Rev. Tuberc., Balt., 1921, **5,** 234–235.

In view of the demonstrated fact that tuberculous foci may react to nonspecific stimuli and conversely that non-tuberculous foci may react to tuberculin, the fallacy of the purely specific concept of the focal reaction is discussed. Focal reactions can be classified according to the Schmidt scheme as those that occur (1) about inflammatory foci of infectious origin, (2) about localized foci endogenous or traumatic in origin and (3) on the basis of diathesis. Such reactions take place not only after specific stimulation, but after a wide variety of biological alterations in the organism. This widened concept of the focal reaction would seem to make clear a number of common clinical observations, such as the flaring up of gall bladder, appendiceal, arthritic or other localized inflammatory foci after remote trauma, vaccination, gastrointestinal disturbance, X-ray exposure, fatigue, chilling, etc.

The focal reaction, no matter how elicited, is essentially a diphasic phenomenon, consisting in an augmentation of inflammation, followed by a diminution, and a tendency to complete restoration to the normal. In a general way it may be stated that the second phase (positive or healing) is closely related to the intensity of the first (or negative) phase, that is, the more intense the inflammatory reaction, the greater the tendency to a complete restoration to the normal. In this phenomenon lies the therapeutic usefulness of the focal reaction.

In the mechanism of the reaction two general factors have heretofore been largely ignored. These include the effects of (1) the so-called Plasmaaktivation (Weichardt)—an omnicellular stimulation by means of proteins, protein split products and a large number of other substances—and (2) the alteration in the permeability of cellular membranes (with vascular, nervous, glandular and other defects).

In the mechanism of the focal reaction in tuberculosis at least three factors are involved: (1) a true and strictly specific sensitization of the organism, (2) a general hypersensitiveness of the organism against proteins and (3) a nonspecific reaction about the tubercle. This last is of course greatly modified by the anatomical peculiarities of the tubercle (avascularity, encapsulation, accumulation of necrotic material, resistance of the tubercle bacillus, etc.). Schmidt's deduction that focal activation in tuberculosis may be beneficial, while theoretically defensible, is clinically unwarranted because the reactions are beyond our control and the digestive processes incident to the reaction may destroy protective connective tissue and result in the dissemination of the disease.

In the therapeutic application of the focal reaction in nontuberculous disease, attention is directed to the fact that favorable results have been reported from combined non-specific stimulation and the use of aetiotropic agents. Thus milk injections and mercury (in syphilis), tuberculin and mercury (in general paresis), milk injections and salicylates (in arthritis), milk injections and luminal (in epilepsy), salvarsan and tuberculin (in lupus), etc., have been reported in this connection.—T. G. H.

2587. Zur Theorie der Proteinwirkung nach Beobachtungen bei der Serumbehandlung des Scharlachs. (The Theory of Protein Therapy from Observations on the Serum Treatment of Scarlet Fever.) Otto Moog. Berl. klin. Wchnschr., 1921, **58,** 388–389.

From 1911 to 1919 the treatment of 2910 cases of scarlet fever was observed. Convalescent serum was found effective as a therapeutic agent, but normal serum of man and Moser serum (a horse serum) were substantially as effective. Recently, 76 cases were treated with Moser serum and the results did not differ essentially from those in which human serum was used. The therapeutic effect is undoubtedly due to a non-specific process. Normal horse serum and the usual antisera from the horse are ineffective in scarlet fever. Current notions as to the mechanism of the non-specific protein effect are inadequate as explanation of the serum therapy in this disease. The process appears to be more complicated.—B. C.

EXPERIMENTAL INFECTION

(See also Number 2576)

2588. Influence de faibles doses de peptone sur l'élimination des microbes injectés dans le sang circulant. (Effect of Small Doses of Peptone upon the Elimination of Bacteria Injected Intravenously.) E. Delcourt-Bernard. Compt. rend. Soc. de biol., Par., 1921, **85,** 738–740.

Injections of peptone stimulate phagocytosis of staphylococci in the circulation.—G. H. S.

2589. Action du sérum antiplaquettique sur l'élimination des microbes introduits dans la circulation. (Action of Antiplatelet Serum upon the Elimination of Bacteria Introduced into the Circulation.) PAUL GOVAERTS. Compt. rend. Soc. de biol., Par., 1921, **85**, 667–668.

Normal guinea pigs and pigs which had received an intraperitoneal injection of 1 to 2 cc. of antiplatelet serum were injected intravenously with cultures of *B. typhosus* or *B. coli*. Bacterial counts of the carotid blood were made at various intervals. Immediately after the bacterial injections no constant differences between the two types of animals could be detected but bleedings taken after 30 min. always showed fewer organisms in the serum-treated than in the normal pigs. In spite of this observation the mortality was higher in the pigs which had received the antiplatelet serum than in the normal control animals.—G. H. S.

2590. Effets de l'injection de plaquettes lavées sur l'élimination des microbes circulant dans le sang. (The Effect of the Injection of Washed Platelets upon the Elimination of Bacteria in the Circulation.) PAUL GOVAERTS. Compt. rend. Soc. de biol., Par., 1921, **85**, 745–747.

Experiments upon guinea pigs demonstrated that the intravenous injection of washed guinea pig platelets markedly reduced the number of *B. typhosus* in the circulation. The reduction following platelet injections is much more pronounced than the reduction taking place after an injection of erythrocytes.—G. H. S.

CHEMOTHERAPY

(See also Numbers 2436, 2505, 2506, 2524, 2577, 2578)

2591. Zur Abortivbehandlung der Syphilis. (The Abortive Treatment of Syphilis.) BLANCK. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 358.

A single neosalvarsan cure of sero-negative syphilis does not free the patient from the disease.—B. C.

2592. Ueber den Einfluss der Salvarsanexantheme auf den Verlauf der Syphilis. (The Influence of Salvarsan Exanthems on the Course of Syphilis.) A. BUSCHKE AND W. FREYMANN. Berl. klin. Wchnschr., 1921, **58**, 347–351.

How salvarsan exanthems are caused is unknown. It is believed to be due to a primary damage to the sympathetic and parasympathetic nervous systems, including also perhaps the peripheral capillaries. Contrary to expectation, these exanthems do not seem to aggravate the course of syphilis in the patient. If anything, they seem to assist toward recovery. Ten illustrative cases are cited. The evidence lends support to the hypothesis that the skin may function as a producer of some defensive substances useful in combatting disease.—B. C.

2593. Vuzin in der Bekämpfung der ruhenden Infektion. (Vucin for Combatting Latent Infection.) MAX KRABBEL. Deutsche med. Wchnschr., Berl. & Leipz., 1921, **47**, 325–327.

A review of the experience in the use of vucin in acute infections puts this substance in an unfavorable light. In progressing infections, it seems of little value, but in the treatment of abscesses and mastitis it is as good as, if not better than other remedies. Vucin loses much of its effectiveness in the presence of pus, and in infected tissues. As a prophylactic in wounds where exudation and pus have not yet developed, vucin functions with more satisfaction.—B. C.

2594. Action exercée par le chlorure de manganèse et d'autres sels métalliques sur la formation de l'antitoxine diphtérique et l'agglutinine du B. coli. (The Effect of Manganese Chloride and other Metallic Salts upon the Formation of Diphtheria Antitoxin and of Agglutinins to B. coli.) L.-E. WALBUM. Compt. rend. Soc. de biol., Par., 1921, **85**, 761–764.

Horses immunized against diphtheria toxin and goats which had been injected with *B. coli* were given intravenous injections of the chlorides of manganese, nickel, cobalt, and zinc. In all instances the injections caused an abrupt rise in the curve of antitoxin production. It is suggested that such metallic salts, acting as "catalysors," should be utilized in the therapy of infectious diseases.—G. H. S.

MISCELLANEOUS

2595. Is Haemolyzed Blood Toxic? W. M. BAYLISS. Brit. J. Exper. Path., Lond., 1920, **1**, 1–8.

The experiments were made with the object of testing whether destruction of red blood corpuscles was accompanied by the passage of toxic substances into the blood similar to those produced in injured tissues. It was found that with extremely rare exceptions, in which intravascular clotting may occur, defibrinated and even hemolyzed blood from the same species are innocuous to the cat and dog. Hemoglobin dissolved in the plasma is able to serve as a carrier of oxygen, but the experiments do not enable a statement to be made as to whether it is as efficient in this respect as the red corpuscles are.—A. C. E.

2596. Sensibilité des animaux éthyroïdés envers les toxines et le Bacille diphtérique. (Susceptibility of Thyroidectomized Animals to Toxins and to Bact. diphtheriae.) B.-A. HOUSSAY AND A. SORDELLI. Compt. rend. Soc. de biol., Par., 1921, **85**, 677–678.

As compared with normal animals the thyroidectomized animals showed no constant differences in susceptibility to diphtheria or tetanus toxins, to cobra venom, or to *Bact. diphtheriae*.—G. H. S.

2597. Sensibilité des rats acapsulés envers toxiques. (*Susceptibility of Rats to Toxins after Removal of the Adrenals.*) J.-T. Lewis. Compt. rend. Soc. de. biol, Par., 1921, **85**, 685-686.

Rats deprived of the adrenals are much more susceptible to injections of adrenalin than are normal animals.—G. H. S.

2598. Zur Frage der Bekämpfung der Heuschrecken mittels des Coccobacillus acridiorum d'Herelle. (*On the Question of Combatting Locusts by Means of Coccobacillus acridiorum d'Herelle.*) R. Kraus. Centralbl. f. Bakteriol. (etc.), Jena, 2. Abt., 1921, **54**, 50-52.

The biological method of d'Herelle of combatting locusts by means of *Coccobacillus acridorum* is valueless due to the fact that the organism is a normal inhabitant of the intestinal canal of the locust.—S. A. W.

2599. Copper: Its Occurence and Rôle in Insects and Other Animals. R. A. Muttkowski. Tr. Am. Micr. Soc., Menasha, 1921, **40**, 144-157.

Copper is found in insect blood in quantities comparable to that of crayfish blood. It is believed that it serves as the nucleus of a respiratory protein-hemocyanin.—J. H. B.

2600. Concerning the Evident Though Neglected Fact that Overconfidence in the Laboratory Minus Adequate Clinical Evidence Equals Many Blunders in the Diagnosis and Treatment. E. G. Ballenger. South. M. J., Birmingham, 1921, **14**, 876-878.

The author insists that too much emphasis is frequently placed on laboratory reports to the exclusion of proper evaluation of clinical evidence and that in syphilis, ureteral calculi, and nephritis, this attitude of the clinician frequently leads to error. He pleads for a proper evaluation of both methods of diagnosis.—J. H. B.

2601. Zur Frage der Senkungsbeschleunigung der roten Blutkörperchen. (*The Problem of the Acceleration of Sedimentation of Erythrocytes.*) Jul. Büscher. Berl. klin. Wchnschr., 1921, **58**, 323-328.

The sedimentation velocity of the erythrocytes was studied in both sexes under a variety of conditions and in different nervous diseases. It appears that a specific accelerator of sedimentation (analogous to immune bodies) does not exist; but that the phenomenon is due to certain biochemical changes in the serum. Acceleration of sedimentation was demonstrated in syphilitic infection.—B. C.

2602. Ueber das Endothel-Symptom. (*The Endothelial Symptom.*) Richard Stephan. Berl. klin. Wchnschr., 1921, **58**, 317-321.

The increased permeability of the capillary walls to corpuscular elements is called the endothelial symptom, which is found in such diseases as scarlet fever, rachitis and influenza. It occurs in the form of minute cutaneous hemorrhages on the forearm after temporary venous stasis of definite intensity of the upper arm. A positive endothelial symptom always indicates pathological changes in the endothelial apparatus. It never occurs in the healthy, and it is always an indication of a pathologically increased penetrability of the capillary walls for the blood elements, especially the erythrocytes.—B. C.

2603. Ueber Beziehungen des Barometerdruckes zu Krankheiten. (*The Relation of Barometric Pressure to Disease.*) Apolant. Deutsche med. Wchnschr., Berl. & Leipz., 1920, **46**, 1256.

The author, 73 years old, describes the effect of changing barometric pressure upon his prostatitis. Rise in pressure causes retention of urine more frequently than other conditions. —B. C.

BOOK REVIEWS

2604. International Health Board Seventh Annual Report. January 1, 1920-December 31, 1920.

The International Health Board reports operations in 1920 against yellow fever in Mexico, Guatemala, Honduras, Nicaragua, and Salvador; on the east coast of Brazil; and in Peru. Sanitary surveillance was maintained to guard against a recurrence of the infection in Guayaquil, Ecuador; and the presence of the disease in West Africa was investigated.

In July the Government of Ecuador announced that yellow fever had been completely eradicated from the country. No new cases of the disease have appeared since June, 1919, in Guayaquil, which is believed to have been the last endemic focus of infection in the Republic. In Brazil the disease is now confined to a narrow coastal strip from Pernambuco to Bahia. Sporadic outbreaks occurring in this region during 1920 were promptly suppressed. An epidemic in the province of Piura, Peru, was completely checked. The Noguchi yellow fever vaccine and serum were employed with encouraging results. The use of the serum was found to reduce the usual mortality (50 to 60 per cent) to 9 per cent.

Hookworm studies made by Darling and Smillie in Brazil showed this disease to be an infection of those who work in the soil, the number of worms harbored by individuals varying with the amount of time they spend in the fields. It is therefore primarily a disease of youths and young adults, particularly males. Women seldom engage in field work after marriage, while few males beyond the age of forty-five have sufficient strength for this employment. The infection of these individuals therefore automatically decreases each year. Hookworm disease is slowly acquired. Field workers between the ages of eight and fourteen were found to have gained worms at the rate of approximately one a week. A group of Japanese colonists who had worked for about two years in highly infected soil in Brazil had just begun to lose the ancylostomes which they had brought with them from Japan and to acquire the necators common to Brazil. The parasites are also slowly lost. Former agricultural laborers who had not worked in the fields for three or four years still harbored well over three hundred hookworms.

Shoes were shown to be an important factor in lowering infection. A group of adult laborers who wore shoes harbored an average of 27 worms per case while their barefooted co-workers had an average of 255 worms each.

In an investigation of the relation of anemia to hookworm disease it was found that seventy-five worms produce in all age groups a definite lowering of the hemoglobin, amounting to about four points. In the case of children and of persons more than forty years of age, an increase of worms beyond this number causes a rapid decline in hemoglobin index. Persons between fifteen and thirty-nine, however, offer such strong resistance to the disease that even 657 to 700 worms cause a decline in hemoglobin of only ten points. The food factor is of importance in determining the amount of anemia produced by hookworms. Well fed persons, even when heavily infected, were found to retain a fair hemoglobin average, while those who were greatly underfed had an extremely low index.—C. C. W.

2605. *Infant Mortality in New York City.* **Ernst Christopher Meyer.** The Rockefeller Foundation, New York City, 1921, 130 pages.

This report, which contains a large body of statistics, covers the thirty-year period from 1885 to 1915. It was revised in 1920 as to some of the fundamental statistics in anticipation of publication.

The death rate of New York City dropped from 273.6 per thousand in 1885 to 94.6 per thousand in 1914. This extraordinary decline did not take place during the last few years alone. Conditions affecting infant life were improving throughout the period. The rate of decline was found to be constant and proceeded with about the same momentum throughout the period studied. It is pointed out that the intensive work represented by baby health stations, home visiting nurses, prenatal work, and other kinds of infant welfare work, whether public or private, was not undertaken on any large scale until after the year 1900. In spite of the fact that the city was spending over $300,000 a year in 1915, and that a large number of private agencies were interested in infant welfare work, there was no perceptible increase in the rate of decline during the period when these agencies were most active. While this is true, broadly speaking, a marked drop in the death rate from diarrheal diseases during the last ten years testified to the importance of this intensive work with respect to these diseases.

The report goes into great detail in analyzing the work done by baby health stations and home visiting nurses both as to quantity and quality. It is frankly admitted that extraordinary results in reducing the infant death rate were accomplished through the work of baby health stations in that these stations succeeded in reducing the death rate among infants enrolled by one-half and this in spite of the fact that the average period of enrollment was only about 104 days.

The fact that the work of baby health stations was not more impressively expressed in a reduction of the death rate was found to be due to the fact that the 56 stations maintained by the city at an expense of over $200,000 reached only about 10,000 out of the 137,000 infants resident in the city in 1915. Incidentally, the investigation shows very considerable cost attendant upon the operation of baby health stations. The work of home visiting nurses is likewise analyzed. The results, as well as the problems involved, were somewhat similar to those which grew out of the operation of baby health stations. The conclusion was reached that the most potent forces which sent the infant mortality rate down in New York City from 1885 on were the great fundamental, sanitary changes which were brought about during this period. They include, among others, purification of water supply, extension of sewage disposal and refuse disposal, elimination of surface privies and manure piles, street cleaning and sprinkling, housing and parks, and above all improvement of the milk supply largely through process of pasteurization.

The report therefore concludes that "there would seem to be much reason to believe, on the basis of the present study, that in a city with a very high infant mortality rate but generally poor conditions of sanitation, the inauguration of intensive infant welfare work, such as that involved in the maintenance of baby health stations or of home visiting nurses, is impractical and would probably yield relatively poor results for the time and money applied. Rather, according to the findings of this investigation, should the fact of a high mortality rate in such a community be used as an argument for general sanitary improvement."—C. C. W.

2606. *Der Kartoffelschorf.* (*Potato Scab.*) H. W. **Wollenweber.** Arb. d. Forschungsinst. f. Kartoffelbau. H. 2. Berlin, 1920, 102 pp., 2 pl.

Since the identification by Thaxter of the causative organism of potato scab, its systematic position and name have undergone a series of changes. At first termed Oospora, it was later recognized to be an Actinomyces. The lack of proper differentiation of the soil actinomycetes led to the fact that this organism was termed *Actinomyces chromogenus*. However, when it was pointed out that more than one soil Actinomyces is able to produce a soluble black pigment on organic media, the term *Actinomyces scabies* suggested by Güssow in 1914 seemed to be more appropriate. As a result of his own investigations, Wollenweber found that not one species, but at least six or seven species of Actinomyces may be responsible for the formation of scab in potatoes. Several organisms were isolated both from diseased potatoes and soil and their action in causing potato scab demonstrated.

Unfortunately, the author of the publication has not recognized the importance of studying his organisms on synthetic media of definite composition, and has based his descriptions almost exclusively upon cultures grown on potato plug or stem.

For humus rich, including moor, soils, of a weakly acid reaction, wet years are "scab" years, while for light sandy soils, dry years are "scab" years. The best method of combating potato scab in the soil is the elimination of all alkaline or alkali producing substances and the use of acid and acid forming materials. 0.05 per cent acid and 0.25 per cent of alkalinity of the soil are stated to be the limiting reactions at which the actinomycetes causing potato scab become sensitive. To be more accurate, the limits of acidity and alkalinity should have been given in terms of hydrogen-ion concentration of the soil.

The publication also includes a study of bacteria and fungi which cause potato diseases, both of the nature of scab or in the form of galls.—S. A. W.

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Early Spring Type. Patients whose hay fever develops in late March, April, or beginning of May, should be tested with pollens of early flowering trees as:—poplar, birch, maple, willow, walnut and oak, which pollinate in the order named.

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